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CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
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1. Additions to Library

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GREAT BRITAIN: COMMONWEALTH
RELATIONS OFFICE
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office year book, 1966.
H.M.S.O.
pp. 658 60 sh
(7396).
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STEINBERG (SH), Ed.
Statesman's year book
1966-67.
MacMillan & Co., Ltd.
pp. 1732 60 sh
[45(w)].

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IASLIC, Calcutta.
Working papers of the two
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Part I and II, 1966.
Part I - Procurement of
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Part II - Devaluation: Its
impact on the development
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Fishery by-products technology
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Technology of Fish utiliza-
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Lettering today: A survey
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pp. 143 63 sh
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Planning: Aspects and appli-
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John Wiley and Sons.
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(7401).

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Capitalism in India: Basic
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MIC AND STATISTICS, 1966.
Bulletin on Food Statistics
(16th issue), 1966.
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WEBB (BH) and JOHNSON (AH).
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mistry, 1965.
AVI Publishing Co.
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ANTIA (FP).
Clinical dietetics and
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(July-June), 1964.
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SOCIETY OF BIOLOGICAL
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Symposium on proteins,
Sept. 22-24, 1966.
Department of Chemistry,
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Hyderabad-7.

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ATMA RAM.
A few thoughts on applied
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Council of Scientific and
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Delhi.

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BIRD (K).
Appraisal of some food pro-
cessing methods of the
future.
United States Department of
Agriculture.

4. F3, ZEO(D9a)
BOARD (PW).
Determination of thermal
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Commonwealth Scientific
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Circular No. 7-P.

5. F3:xP, FP
Recent advances in food
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6. F3Zc
BROWN (JD).
Factors associated with the
cost of producing milk for
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Georgia Agricultural Experiment
Stations.
Bulletin No. N.S. 170.

7. F3Z1
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Danish Meat Research Institute.

8. F3Z24
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Swine performance, carcass
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Georgia Agricultural Experiment
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North central Regional Research
Publication No. 158. Contd.

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Consumer use of Turkey.
University of Minnesota,
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Station Bulletin 474, 1964.

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Seminar on Agricultural
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Isotopes rayonnements
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University of Minnesota,
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14. J341
Central Potato Research
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Organization and working
arrangements.

15. J372
SPENCER (WF).
Phosphorus fertilization of
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University of Florida,
Agricultural Experiment
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Bulletin 653, March 1963.

16. J37943
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Economic evaluation of grade
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Nutritive value of pond-
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19. L:573
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21. Y
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IS: 3718 - 1966.
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IS: 3713 - 1966.

6. INDIAN STANDARDS INSTITUTION
Specification for farm milk cooling tanks.
IS: 3661 - 1966.
7. INDIAN STANDARDS INSTITUTION
Specification for insulated ~~aluminum~~ milk storage tanks
IS: 3662 - 1966.
8. INDIAN STANDARDS INSTITUTION
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IS: 3509, -1966.
9. INDIAN STANDARDS INSTITUTION
Methods of sampling and test for butter.
IS: 3507 - 1966.
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Transport from trapping area to the nearest rail-head.
IS: 3699 (Part I) - 1966.
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Transmission and host range of the tomato yellow leaf curl virus.
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6. Dairy Research Institute, New Zealand.
Thirty-eighth Annual Report for year ended 31st July 1966.
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3. Central Electrochemical Research Institute, Karaikudi.
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4. Central Institute of Fisheries Technology, Ernakulam.
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12. National Institute for Research in Dairying, Berkshire. Report 1965.
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- L9C PEDIATRICS
- L9C:4 Disease, Child
- DASTUR (DK) and others. Maple syrup urine disease in Indian baby: Branched chain amino and ketoaciduria (with 3 plates). Indian J med Res 54;1966;915.
- L9C:461 Nutritional Deficiency, Child
- FLETCHER (K). Observations on the origin of liver fat in infantile malnutrition. Am J Clin Nutr 19;1966;170.

From this issue onwards, it is proposed to include another section Part III, i.e. "TECHNICAL NEWS BRIEF". This will include latest brief information on Food Machinery and equipment and Processing Technique. These will be collected while scanning the journals for title service.

LIBRARY BULLETIN

Feb, 1967

Volume Six, Number Two
FEBRUARY 1967

CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
MYSORE

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1. <u>Additions to Library</u>	E9G,92X	Nucleic Acid
D <u>ENGINEERING</u>	E9G,92Z	Amino acid
E <u>CHEMISTRY</u>	E9G,92Z2	Protein
F <u>TECHNOLOGY</u>	E9G,92Z2:4	Protein synthesis
K <u>ZOOLOGY</u>	E9G,96	Lipid
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	KX	ANIMAL HUSBANDRY
PART IV. <u>Periodicals-Title Service</u>	KX:1	Animal Nutrition
A <u>GENERAL SCIENCE</u>	KX31:71	Milk
A:f <u>Scientific Research</u>	KX31:71:(G91)	Milk Microbiology
B <u>MATHEMATICS</u>	KX31:71:(G912)	Milk Bacteria
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D <u>ENGINEERING</u>	KX35	Poultry
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E94 <u>Fat, Fatty Acid</u>	L:4	Disease
E95 <u>Pigment</u>	L:523	Food Hygiene
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	S	PSYCHOLOGY
	X	ECONOMICS

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Vol. 6, No. 2, February 1967.

7. Additions to Library

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application) 1964.
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(7433).
2. D65.4 K3
WALSTON (JA) and MILLER (JR) Ed.
Transistor circuit design, 1963.
McGraw Hill Book Co., Inc.
pp. 523 Rs. 34.50
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Vol. 21, 1966.
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Bergmann, J.F. München.
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ings of the third European sym-
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1. F3,A
BIRD (K).
An appraisal of some food proces-
sing methods of the future.
US Department of Agriculture.
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Consumption and expenditure
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Georgia Agricultural Experiment
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Technical Bulletin N.S. 54,
September 1966.
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Technique and equipment for
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of chemicals into soil.
Georgia Agricultural Experiment
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Bulletin N.S. 173, September 1966.

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Status of electrodialytic demineralization of whey and whey products.
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WISE (JO) and WILLIAMS (DH).
Optimum farm plans for a livestock-poultry farm in Telfair County, Georgia.
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ONATE (LU).
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Georgia Agricultural Experiment Stations.
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Agricultural Economic Report 95, ERS 314.
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India and the UN family work together on projects for development.
International Cooperation in action.
21. X8(J251):51
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Georgia Agricultural Experiment Stations.
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Economic development of the
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products and water resources.
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Specification for wooden boxes
for packaging apples.
IS: 3728 - 1966</p> <p>2. INDIAN STANDARDS INSTITUTION
Specification for foot sprayer.
IS: 3652 - 1966.</p> <p>3. INDIAN STANDARDS INSTITUTION
Method for sampling of bigger
size foodgrains.
IS: 3714 - 1966.</p> <p>4. INDIAN STANDARDS INSTITUTION
Specification for corn sampler
(Parkhi type)
IS: 3729 - 1966.</p> | <p>5. INDIAN STANDARDS INSTITUTION
Specification for radish.
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Specification for fenugreek,
whole.
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Specification for celery seeds
IS: 3797 - 1966.</p> <p>8. INDIAN STANDARDS INSTITUTION
Specification for fennel seeds,
whole
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PART II 1. Reprints

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| <p>1. E92Z
YOSHIDA (M) and others.
Studies on the taste of amino
acids. Part I. Determination
of threshold values of various
amino acids.</p> <p>2. F3,ZF4
MOSSEL (DAA) and others.
Necessity of a prior revivifi-
cation for the enumeration
of enterobacteriaceae in irra-
diated or non-irradiated,
dehydrated foods.
Central Institute for Voeding-
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BEERENS (DAA) and others.
Study of media used for the enu-
meration of spores anaerobic
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BARAGANO (M) and MOSQUEDA
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Separata de la Memoria de la
Sociedad de Ciencias Naturales
La Salle. 26(73); 1966; 62.</p> |
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GONZALO LUNA (L).
Processing of shrimps in brine.
Boletín del Centro de Investi-
gaciones, Pesqueras Serie
Tecnología 1(1);1966; 1.
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Microbiological quality con-
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Fette Seifen Anstrichmittel
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Bulletin de la Société de
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Van SCHOTHORST (M) and others.
Estimation of the hygienic
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medizin 13(3);1966;273.
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ceptible pepper.
Phytopathology 56(10);1966;1152.
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ONATE (LU) and TUBELLEJA (MJ).
Mineral and vitamin retention
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Philippine J Nutr 17(3);1964;
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1. Government Pest Infestation
Laboratory, Denmark.
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2. National Research Development
Corporation of India.
Twelfth Annual Report and
Statement of Accounts for the
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3. Nutrition Foundation, Inc,
New York.
Twenty-fifth Anniversary Report.
4. Visveswaraya Industrial and
Technological Museum, Bangalore.
Annual Report 1966.

PART III. TECHNICAL NEWS BRIEF

D6,8(MJ382) Milling machine

1. THE SMALLEST MILLING MACHINE

At the research centre of the milling and bakery industry in Caske Skalice (Czechoslovakia) a new type of milling machine for grain has been invented in contrast to the usual milling machine in which grain is crushed between heavy metal rollers. The new machine crushes the grain by constant repetitive blows and is the smallest in the world. The regular milling machine weighs 3,000 kilograms, while the latest model weighs only 113 kilograms which requires far less electricity and naturally takes up less room. [Coconut Bulletin, 20(8);1966;185]

F131 Aluminium

2. ALUMINIUM SUBSTITUTES

Although our country is highly deficient in copper, zinc and lead which are needed in large quantities in various industries, scientific research has succeeded in substituting aluminium in the place of these metals. India's resources of aluminium are abundant. In the successive five year plans aluminium has been given the pride of place in the development of non-ferrous metals. Aluminium possesses a wonderful versatility of qualities.

Aluminium utensils are competing with stainless steel, copper, brass, enamel ware and earthen ware. Aluminium foils are good substitutes for lead, tin, paper and plastics. Aluminium electricals conductors are fast replacing copper in our country. The cable industry has already switched over to aluminium conductor cables for all except highly specialised items.

Aluminium and its alloys have been used in considerable quantities in food packing in various countries. Tinplate has been used for packaging and canning mainly because of its adaptability, ease of manufacture and resistance of corrosion. Aluminium possesses all these advantages.

The National Metallurgical Laboratory is undertaking research and development work in the adoption of metals and alloys readily available in the country as substitutes for scarce non-ferrous metals. [Yojana 10(26);1967;12].

F145 Tin

3. THE TINLESS CAN

The latest issue of the Tin Research Institute's quarterly journal, Tin and its Uses, No. 71, suggests that inspired talk about cans made of tin-free steel will not greatly affect the canning industry. "The thought comes to mind", it is stated, "that in this chasing after savings there is a danger that the

public image of the can may fade and lose that priceless asset, its glamour. For there is glamour in the brighter high reflection from the ordinary round can; it is the glint of the stain-free surface that proudly proclaims its cleanliness; it does not compromise about dust and dirt: if they are there they show.

"There are, of course, more than monetary considerations, or considerations of the operation survival kind, at stake in the proposal to replace tinplate by chemically treated and fully enamelled steel sheet. It is not a straight exchange of the one for the other in most cases because a very large proportion of tinplate cans have, additionally to the tin coating, on the steel, one or sometimes two coatings of stoved enamel for extra protection. A very nice balance between the protection afforded by tin and enamel is provided deliberately in a large proportion of tin-cans. Cover up all the tin and it is not able to exert its normal inhibiting action upon corrosive liquids such as fruit juices. The aim in such cases is to leave available at the steel, below any holes or pores that there may be in the enamel, sufficient tin to exert a local inhibiting action.

"The art of canning food in tinplate cans has been brought to near perfection, and there are volumes of information concerning canned foods and their interaction with the tinplate container. In a large proportion of instances, the attack on the steel of the can by aggressive substances in foods, the attack on the steel of the can by aggressive substances in foods, particularly in fruits and vegetables, is mitigated and controlled by the extent to which the attack can be switched to the tin coating; that is to say, the dissolution of the tin produces a nullifying effect, as distinct from a neutralising effect. For this reason it is unlikely that much of the vast amount of technical 'know-how' about canning all kinds of foods in tinplate cans will pass as a heritage to a tinless substitute". [Tin-Printer and Box Maker 42(503);1966;10].

F3:xP Food Preservation

4. PRESERVING FOOD BY PUTTING IT TO SLEEP

Food can now be "put to sleep" to keep it fresh during long journeys and storage periods.

A new preserving process developed in the United States is based on the well known biological fact that the presence of oxygen causes fruits and vegetables to ripen, rot and decay. It uses a machine which purges all but one per cent of the oxygen from the food storage enclosure and pumps into it a carefully controlled atmosphere of inert nitrogen. This, in effect, put the food to sleep, temporarily stopping or slowing biological processes which lead to deterioration. The equipment can be installed in a truck. Amid the nitrogen, produce can keep fresh for several days-or even for several weeks on an voyage. The process has also been tried in experiments with meat, fish and even flowers with impressive results [Science and Engineering 20(1);1967;7].

F3:xP,9BN Food, Preservation, Nisin

5. N I S I N

Dear Sir,

As sole manufacturers of the commercial preparation of nisin Nisaplin-may we comment on the correspondence relating to the review entitled "Mode of action and applications of Nisin" by Miss Peggy Boone (May issue)?

Nisaplin is now used in many countries but is supplied only on the understanding that it will be used in accordance with existing Regulations, and these we are at pains to point out to prospective users. Furthermore, in our advisory capacity we emphasise that where process reductions are under consideration for low acid canned foods, these must not result in processes insufficient to destroy spores of *Cl. botulinum*.

It is, of course, important whatever process changes are being considered, that canners should appreciate the basic principles governing the calculation of heat processes to which your correspondents have drawn attention.

Yours faithfully,

B. McCANN

[Food Manufacture 41(12);1966;37].

Home sales and Export Mana
Aplin & Barrott Ltd.,
Trowbridge, Wilts.

F3;a241;b12;a86 Food contamination

6. N.R.D.C. INVESTIGATE FOOD CONTAMINATION

The problem of solid contaminants in foodstuffs is being investigated under the joint sponsorship of the National Research Development Corporation and Marks and Spencer Ltd., in association with British Bakeries Ltd. and United Biscuits Ltd. The investigation is concerned with methods for the detection of solid contaminants in foods and the identification of methods warranting further development.

The study is being carried out by D.B. Foster Associates, industrial consultants specialising in automation, and by Mr. J.C.G. Bell, who made an initial survey of the problem for Marks and Spencer. The investigation is concentrating on solid impurities in packaged and processed foods.
[Chemical Age 96(2476/7);1966;1151].

F3;91;a86 Food Protein

7. BANGALORE PROJECT STUDIES PROTEINS.

A research programme now underway at one of India's leading science laboratories may set the pattern for a new approach

broken by hand; the egg liquid is fed through filters and strainers to remove unwanted material. Later it is cooled to a temperature of two degrees centigrade ready for canning. (The Planters' Chronicle 62(2);1967;28).

F3ZGC Tea Beverage

13. BRITONS NOW DRINK MORE TEA

The average Briton now drinks 5-1/2 cups of tea a day all the year round, out of a total of 8-1/2 cups of beverage.

The estimate, based on a consumer study, is reported by Mr. John Brooke, Chairman of the Brooke Bond Tea group, in his annual report to shareholders.

Last year Britain imported a total of 559,500,000 lb. of tea, including 252,500,000 lb. from India, 175,900,000 lb. from Ceylon and 4,800,000 lb. from Pakistan. (Planters' Chronicle, 62(1);1967;20).

F52 Plastics

14. PERMEABILITY OF PLASTICS

The plastics institute has published a monograph entitled the permeability of plastics, films, the first of a series of new publications providing critical appraisals of activity within the plastics industry. The document (62 pages size A4) summarises the available information on the permeability of plastics films to gases and vapours, and demonstrates that this information is inadequate and that the methods of test serve only to complicate the subject unnecessarily. The booklet will help workers in the packaging field to understand the subject and will indicate aspects requiring further study. Copies of the monograph may be obtained from the Plastics Institute, 6 Mandeville Place, London, W.1, price 15 s. (Postage 1s extra). A list of the Institute's other publications is available on request. (Tin-Printer & Box Maker 42(503);1966;10).

F5895 Protective coatings

15. PROTECTING BUILDINGS FROM MOULDS ON FUNGI

Moulds and fungi which might grow on painted surfaces inside buildings are prevented by a protective coating developed by a British firm.

For use in hospitals, hotels, food-processing plant, and wherever a high standard of hygiene must prevail, the material is said to be highly effective against yeast spores bacillus subtilis and staphylococcus.

Supplied as a soft paste, the protective is spread by brush form a thick continuous plastic skin which fills all cracks and joints. Two layers are normally applied, and in each case coverage is from 15 to 20 square yards for each gallon.

The applied layer is said to have a low surface tension which prevents condensation forming into beads of water. It is also claimed to retain its elasticity throughout its active life. (The Planters' Chronicle 62(2);1967;31).

G91 Microbiology

16. MICROBIOLOGICAL DETERIORATION IN THE TROPICS

Comprising papers (with discussions) read at a symposium organised by the microbiology group held on 8th and 9th April, 1965 at the London School of Hygiene and Tropical Medicine, London, W.C. 2.

Monograph No. 23, Price: £3 10s. 0d. Price to members: £2 12s 6d

Orders should be sent to: The Publications Department,
Society of Chemical Industry, 14 Belgrave Square,
London, S.W. 1. (Tel: Belgravia 3681).

(Chemistry and Industry, No. 52;1966;vi).

J:4386:634 Insecticides, Plant

17. STURTEVANT WIN U.S.S.R. ORDER FOR INSECTICIDES PLANT

CONTRACT worth £610,000 for a U.S.S.R. agricultural insecticides plant has been awarded to Sturtevant Engineering Co., a member of the Drake and Gorham Scull group. The company believes it won the contract in face of U.S., German, Japanese and French competition by offering advanced technological know-how rather than a price advantage. During the two-year period of discussions the Techmashimport Sturtevant have supplied three pilot plants for insecticide production at a total cost of £180,000.

Most of the components for the new plant will be fabricated at Sturtevant's Denton, Lancs, works and include equipment for grinding, proportioning, blending and packing the materials at a rate of 30,000 tons/year.

Delivery will begin in 12 months time and the plant is scheduled for completion in 1968. (Chemical Age 96(2474);1966;106

X8:513 Market Research Advertising

18. NEW NAME, NEW PACK FOR BACON

A new name and a new pack designed to increase sales of Wall's bacon, have been decided upon following market research conducted throughout the country in which hundreds of housewives were asked their opinions of various descriptive names. Name decided upon is "Full Flavour".

The pack has been redesigned and the name "Full Flavour" appears on the background of a frying pan symbol designed to give more prominence when on show at point of sale. The type of cut is clearly indicated with bright red flashes together with the theme "sealed in freshness".

T. Wall & Sons (Meat and Handy foods) Ltd., Atlas Road, Willesden, London, N.W. 10. Tel Elgar 6543. (Food Manufacture 41(12);1966;78).

X8(F39H) Fruit processing factory

19. A FRUIT PROCESSING FACTORY GOES INTO PRODUCTION

Jawahar Fruit Products, a factory for processing fruits and vegetables, which started functioning recently at Cheruvannur, is another feather in the cap of the Rural Industries Project Koshikode (Kerala State). The factory with an initial production capacity of 500 kgs per day, is the first of its kind and size in the area, providing employment to 20 persons. The production and labour strength are expected to be doubled in a few months.

The factory which is at present manufacturing squash, Jam, jelly, marmalades, preserves, candies, pickles, etc. out of various fruits locally available, has also plans to manufacture 'Pectin' and 'Peppin' from pappaya.

Technical guidance for setting up of the unit was provided by the Central Food Technological Research Institute, Mysore, and the Small Industries Service Institute, Trichur. Some of the workers were specially got trained at the latter institute. The project authorities helped the unit in obtaining F.P.O. licence from the Food and Agricultural Ministry, sugar quota from the State Civil Supplies Department, and quota for tin containers from the Agricultural Marketing Adviser, Nagpur.

The items produced by the unit have a great demand at home and abroad. Equipped as it is with modern machinery, the factory intends to tap foreign markets, especially in Arab States. (Yojana 10(26);1967;16).

X8(F39T2D91):545 Cashew Kernel Export

20. TREND IN EXPORTS OF CASHEW KERNELS FROM INDIA

Year	Quantity (tonnes)	Value (000 Rs.)	Unit value of exports in Rs./Kg.
1961-62	41,755	18,17,05	4.35
1962-63	48,558	19,36,12	3.99
1963-64	50,995	21,41,48	4.20
1964-65	55,678	29,06,16	5.22
1965-66	51,266	27,39,47	5.34
Average	49,650	23,08,06	4.65

Marketing Newsletter, November 1966;8.

PART IV. PERIODICALS - TITLE SERVICE

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D, ENGINEERING
D65 Electronics

BILBROUGH (J). Elementary microwave and HF theory. Food Tr Rev 36;1966;43.

E CHEMISTRY

E:3 Analytical Chemistry

BLATT (WF) and PITMAN (FT). Evaluation of an assembly for automated column chromatography. J Chromatog 24;1966;348.

E6892 Starch

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E95 Pigment

LOHMEYER (S). Enrichment by liquid-liquid extraction of the traces of tin in hydrochloric acid solution of pigments digested by sodium hydroxide. Fette Seifen Anstrichmittel 68;1966;863.

E9G BIOCHEMISTRY

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KX351:1 Nutrition, Fowl

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MARCH, 1967

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CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE, MYSORE

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PART III. Technical News Brief

7

F3 Food Technology
F3 Foods

ADM Produces new foods

Archer Daniels Midland has started to produce several new foods based on vegetable proteins. The foods are made at a plant recently built at ADM's soybean processing complex, Decatur, Ill.

One of the new foods has the texture and "chew" of meat and can be flavored to taste like meat. This textured vegetable protein (TVP) can be blended into foods containing granular, chunk, or strip meats, ADM suggests. In its dry state, TVP requires no refrigeration. ADM is studying its potential in instant foods for both US consumption and foreign distribution, especially in countries where refrigeration is limited. Once the product is hydrated, it takes on the nutritional qualities and characteristics of meat.

At the same Decatur plant, ADM is also producing three other high-protein foods for the US's foreign feeding programs: A soy beverage; a corn-soy dry milk foods; and a cereal protein.

Chemical and Engineering News 44(47);1966;60.

F3 Foods

New Sources of Food are Proposed by UN Group

A ten-point program to increase world protein-food supplies was one topic of discussion by the Advisory Committee on the Application of Science and Technology to Development, a specialized body of the United Nations Economic and Security Council, at a meeting in Rome last month.

The program proposed feasible solutions to the current and future problem of malnutrition. Among its suggestions were: developing crops having genetically improved protein value; adding synthetic amino acids to enrich wheat and corn products; promoting research on yeasts and microorganisms as food suppliers; and educating the public to incorporate unconventional supplements (e.g. hydrocarbon-derived protein concentrates) to their diet.

The meeting's agenda also included an examination of how to maximize natural resources relating to water, energy and mineral development and how to carry out a "World Plan of Action" drawn up by the committee in February 1966 to intensify the applications of science and technology.

...8

The advisory committee, which first met in February 1964, is composed of internationally known experts serving as individuals rather than representatives of governments.

Chemical Engineering 73(25);1966;82.

F3:xP,E Food, Packaging

Polyethylene meets FDA Food Requirements

For blow molding sheet and thermoforming applications this new high density polyethylene resin, Marlex 6003, is now available. It features high impact resistance, maximum stiffness, high melt strength. It is an ASTM type III, class A, grade 5 resin. It has a density of 0.960 and a melt index of 0.3. It may be used in contact with food or food products including packing or holdings food during cooking, as it meets the requirements of FDA regulation 121,2501, according to the makers. Phillips Petroleum Co., Department PE, Bartlesville Okla.

Package Engineering 11(11);1966;144.

F3:xP,E Food, Packaging

Liquid smoke spraying

Designed for easier application of liquid smoke as a spray, the process and product package developed calls for use on meats while still wet, to insure consistent penetration. The product can also be used in place of natural smoke on frankfurters and bologns. "Smokertie SR-1" from General spice, Inc., 1226 E. Elizabeth St., Linden, N.J.

FOOD TECHNOLOGY 20(11);1966;28.

F3;a241SAL;b12;a86 Food, Salmonella, Contamination

SALMONELLA CONTAMINATION OF COMMERCIAL FOOD PRODUCTS AND DRUGS has the U.S. Food and Drug Administration worried-sufficiently so that the agency three months ago created the post of "Salmonella Project Officer" to coordinate information and planning against the menace. Reason for the worry is a rash of salmonella contaminations dating from last winter and culminating most recently in the nationwide recall of Borden Co.'s skim milk product, Starlac.

A rise in salmonella infections in Atlanta, Ga., last February was followed by local recalls of contaminated dried milk and milk products from processors in several states in the ensuing months. Last month, salmonella were found in Borden's plant

at Dixon, Ill., and since the plant supplies the entire country, national recall of Borden's product followed.

Once rare, salmonella contamination of animal-based drugs has also become a problem. Since July 1, there have been 53 recalls because of contamination of such products as pancreatin and thyroid extract.

The problem is compounded by an industry tendency to larger processing units, the prevalence of salmonella in man, animals and the environment, and a lack of knowledge of how the organism spreads.

Chemical Engineering 73(24);1966;62.

F3;9U Food, Flavourings

LEMON OILS are available that have been specially formulated for oxidation, color, odor, and flavor stability-particularly in alkaline systems. Containing no antioxidants, the chemically stabilized oils have components that are FDA approved for food flavorings - GLIDDEN CO., CLEVELAND, OHIO.

Chemical Engineering 73(24);1966;86.

F31 Rice

F31:d2,QJ Rice, Milling

Solvent Milling Increases Rice Yields

A new solvent rice milling process increases milling yields from whole grain rice up to ten per cent and produces a white, less fat product with a extended shelf life. Rice oil and proteins unobtainable through conventional milling are also recovered with the new method. The continuous new process produces about two pounds of rice oil for each hundred weight of unmilled rice as opposed to the previous necessity of separately extracting rice oil from rice bran. Rice bran obtained has approximately 17-20 per cent more protein than that received with conventional methods.

In the new process, bran layers of rice are chemically softened. Rice oil, is used to penetrate the layers of brown rice.

After this conditioning, treated rice undergoes milling for bran removal. During milling, hexane miscella, an oily solvent, is used as a washing and lubricating agent. Finally, solvent is removed from rice, bran is removed from miscella slurry, and the remaining oil is extracted.

Chemical method achieves bran removal without abrasion, reduces required pressure and keeps rice temperature low. These factors mean reduced breakage and thus increased yields.

The X-MR process was invented by Truman B. Wayne of Houston, Tex., and was developed by Wayne and Food Engineering International, Inc., a subsidiary of Riviana Foods Inc., Houston, Tex.

Canner/Packer 135(13);1966;52.

F31:d2,QJ Rice, Milling

Chemical Milling of Rice

The age-old method of processing rice may soon yield to modern technology. Instead of removing the bran from the white rice by mechanical abrasion, this new process softens the bran in a miscella of hexane and rice oil, then removes it by gentle milling. In addition to yielding a higher grade rice, the method produces an edible bran. In nations where rice is the largest portion of the diet, the process offers a possibility that more people can be fed with the same amount of crop.

Chemical Engineering 73(25);1966;4.

F39A Vegetable
F39A,ZFC;06;a86 Vegetable, Frozen, Quality, Variability

Frozen Vegetable quality loss caused by In-pack Dehydration

Frozen vegetables are subject to a "serious loss of quality" from inpackage dehydration. A study by the National Research Council, Ottawa, Canada, found that 80 per cent of the 66 samples examined had a frost content over 2 per cent and that 14 per cent of the samples contained over 8 per cent frost content. This is considered excessive.

Research into the control of frost build up in frozen vegetables after they leave the processing plant would be worthwhile according to the research report. The studies showed that "the process of desiccation apparently progresses during freezing, storage, transportation and retailing and is accelerated by temperature fluctuation". As the frost increases clumping and discolouration become more frequent and odor and flavor changes occur. Extreme dehydration causes shrivelling in peas and brown color in beans. The changes "largely are irreversible". (Canner/Packer 135(13);1966;51).

F39H Fruit

F39H:xP Fruit, Preservation

Heat Treatment Protects Produce from Decay

Dipping fresh fruits and vegetables in hot water or exposing them to hot, moist air killed spoilage-causing organisms without harming the commodity, marketing researchers of the U.S. Department of Agriculture report.

Cataloupes, peaches, mangoes, and lemons are already being heat-treated commercially by packers, but such treatments are still experimental for other commodities, said scientists in USDA'S agricultural Research Service. To date, laboratory heat treatments have effectively reduced spoilage of blueberries, cantaloups, cranberries, lemons, oranges, peaches, papayas, red raspberries, strawberries, and sweetpotatoes.

Additional tests are being made to protect bell peppers, seed potatoes, chestnuts, figs, and tangelos from decay. These treatments are also being tested on apples and pears to control scald an unattractive skin mottling that may occur during storage and marketing.

Besides being potentially cheaper and less hazardous than chemical decay control methods, heat treatments kill some decay organisms that chemicals can't reach. Certain bacteria and molds get under the skin of a commodity where they are protected from chemicals, but enough heat can penetrate to kill the organism before it spreads.

Appearance, taste, firmness, and overall commodity quality have not been harmed by heat treatments applied under carefully controlled conditions. But good sanitation is more essential than ever, because recontamination of the commodity could cause heavy losses. (Canning Trade 89;1966;31).

F39K,ZJQ;96Z;b12:fD Citrus, Juice, Oil

Peel Oil Method

The quantity of peel oil in processed citrus juices affects the flavor of the product and must therefore be controlled closely. A new, rapid and accurate method developed by USDA researchers W.C. Scott and M.K. Veldhuis permits this control in products ranging from 0 to 0.100% of oil without need for diluting the juice. Basis of the method is the quantitative reaction of d-limonene with bromine in acid solution, and the use of a miscible volatile

solvent to aid in extraction and distillation. Procedure: To 25 ml of juice add 25 ml of isopropanol and distill. Acidify the distillate with HCl and titrate with 0.025 N potassium bromate-bromide solution to disappearance of color from methyl orange indicator. The method is well adapted for plant use, requires inexpensive equipment and supplies, and a determination can be completed within seven minutes. Reprint 3204 from U.S. Fruit & Veg. Products Lab., 600 Ave. S, N.W., Winter Haven, Florida 33880. (Food Technology 20;1966;30).

F39ZKE Candy-coated

Cellulose Coatings Might be Possible with Candy
(By Herb Knechtel, 10/4/66, CI&CJ)

The coating of nuts, and perhaps hard candy, with liquid cellulose material is not beyond the realm of possibility. Soluble cellulose coatings have been prepared and used on certain foods. The coatings have no nutritional value and usually lack resistance to moisture-vapor transmission but adjuncts such as mono-glycerides might be added to gain the latter quality.

A flavored gelatine center for coated candies might prove to be popular with consumers. It is feasible to produce a gelatine dessert center of say 50 per cent solids content by using a preservative, and marketing the product as refrigerated candy. There are several candies that might be crossed with ice cream, baked goods and desserts. (Candy Industry 127;1966;25).

F3Z1 Meat
F3Z1:xP,FC Meat, Freezing

Thaw frozen Meat before Cooking?

Research into "influence of freezing and thawing on meat products for institutional use" is being conducted by the meats division, Department of Animal Science, University of Illinois, in cooperation with the Central Food Stores of the Housing Division of the University of Illinois.

Here are some of the questions the research seeks to answer

- Should the product be thawed prior to cooking?
- If so, under what temperature-humidity conditions; and should it remain wrapped during the thawing process?
- If it should not be thawed, how much more cooking time should be allowed?
- Will cooking time from frozen state be affected by width, length or thickness of the cut?

The beef, pork, veal and lamb cuts used in the investigation will be selected in accordance with a survey of hotel and restaurant meat suppliers indicating the cuts in which there is the greatest interest based on volume usage.

Support for the study comes from the National Association of meat purveyors and the National live Stock and meat board. (Food Technology 20;1966;72).

F3Z51 Protein

F3Z51;91;a27:xP,FC Protein, Loss, Freezing, Chicken

Relate protein loss to rate of freezing

Comparative studies on muscle from fresh (unfrozen) and freshly frozen chickens showed that changes in muscle proteins depended on freezing rate, the NRC review for 1966 says. This was part of the work of the food technology division during the year.

The review says "as part of work on biochemical changes associated with quality deterioration of poultry meat during freezing and storage, the influence of freezing on protein changes were studied".

Slow freezing (in a cardboard box at -18°C) caused a larger loss of drip on thawing, a larger loss of nitrogenous constituents and nucleic acid derivatives in the drip, and a larger loss of water-holding capacity of the meat, than fast freezing (by immersion in a methanol-dry ice mixture).

To sum up: results of experiments indicated that prefreezing tenderization of ageing and rapid freezing are necessary for maintenance of high quality. (Can Food Indus 37;1966;43).

F3Z5Z Fish

F3Z5Z;91 Fish, Protein

World's First Factory for Fish Protein Concentrate

The world's first factory for industrial production of fish protein concentrate-for the time being geared towards animal feed production but also capable of producing concentrates for human consumption-started operations recently in the small fishing village of Bua on the Swedish West Coast. Designed for a capacity of 10,000 tons a year, it belong to the Swedish producers of pharmaceuticals AB Astra, Södertälje, who have invested some ten years of research and Kr. 14 million (£900,000) in the project.

The present operation is based on fish meal as raw material. However, by using upgraded raw materials and following still stricter hygienic procedures a concentrate for human consumption can be obtained. Such a product has already been approved by Sweden's National Institute of Public Health, the first to be endorsed officially anywhere. (Food Processing & Marketing 35;1966;467).

F3Z5Z, ZFC Fish, Frozen

Fresh Frozen Fish Taste Fresh

Nitrogen freezing does not cause a noticeable change in the taste of seafood. This is the conclusion of a U.S. Bureau of Commercial Fisheries report after examination of fresh seafood compared to seafood frozen in a nitrogen tunnel.

Bay and calico scallops have been frozen in a nitrogen tunnel in Williston, N.C. by Elmer Willis. Trade Winds Co., Thunderbolt, Ga., will also employ nitrogen freezing on an experimental basis. (Canner/Packer 135;1966;51).

F3Z809M Eggshell

Egg shell Analysis by new method

Egg shells were analyzed for calcium carbonate by a previously unused (on eggs) thermogravimetric technique. This technique consists of weighing shells under conditions of constantly increasing temperature and here in an atmosphere of carbon dioxide.

The method performed in a satisfactory manner for the determination of calcium carbonate but was not useful for determining the amount of minor constituents. Shells of varying thickness and strength did not vary in their thermogravimetric characteristics.

(Research continues relentlessly to find some better method of relating observed shell characteristics to actual breaking strength or characteristics in commercial channels. So far little success!)- Hoffman, I. and J.R. Hunt; Poultry Science 45; 596-600 (1966); Canada Department of Agriculture, Ottawa, Canada. (Poultry Tribune, 72;1966;65).

KX351 Poultry

New Poultry Breed

A newly developed poultry breed-the 'Hybrid Seven' which produces large brown eggs and is highly resistant

to broodiness is being offered to overseas markets by one of Britain's biggest exporters of day-old chicks.

The 'Hybrid Seven'-produced by F. & G. Sykes Ltd. of Warminster, Wiltshire, South-West England - has been developed from the Rhode Island Red and Light Sussex strains. It is for sale overseas either as a day-old commercial or as parent stock.

The 'Hybrid Seven' is claimed to have a proved potential of 275 eggs in 500 days from hatch (with 80% or more large and standard eggs), and a rearing mortality of less than 2%. It is also claimed to have a placid temperament.

F & G. Sykes Ltd. exports or produces overseas more than 1,500,000 commercial egg-laying chicks in nearly 40 countries. (Planters' Chronicle 62;1967;67).

M98 Packing

AN ADHESIVE, Pliogrip AD-1199 reportedly reduces veneer waste and cuts the cost of finished plywood. Filling the need for an adhesive that can edge-glue narrow strips of veneer together and make fullsize plywood sheets, the bond is said to last indefinitely and form quickly. GOODYEAR, AKRON, OHIO. (Chemical Engineering 73;1966;86).

M98 Packaging

HOT-MELT ADHYSIVE Thermogrip 1336 is a polyethylene based formulation that is said to cost less than other adhesive with comparable properties. Supplied in cordlike form on a reel, the product is used in the packaging and paper-converting industries for high-volume, routine applications - B.B. CHEMICAL DIV., UNITED SHOR MACHINERY CORP., BOSTON, MASS. (Chemical Engineering 73;1966;72).

M98 PACKAGING

Forms, Fills pouches, Puts them in cartons

The combining of two machines - a Hayssen expandomatic verticle form-fill-seal unit and a Redington cartoner is making possible a pouch and carton packaging system capable of speeds from 60 to 300 a minute. Its standard size ranges are from 1-1/2 to 9-1/2 inches wide and 4-15 inches long for the pouches and from 3/4 to 2-1/2 inches high, 2 to 6 inches wide and 3-3/8 to 8 inches long for the cartons. The system can package one to four pouches

of one to four different products in a single carton. The Hayssen resistance system seals pouches; the Redington hot-melt glue system seals the cartons. All standard Hayssen feed systems (Pumps, scales, augers, and volumetric) can fit on this equipment. Hayssen Mfg. Co., Dept. PE, Sheboygan, Wis. (Package Engineering 11;1966;135).

M98 Packaging

Polyethylene nozzle for cans is threaded

This new threaded nozzle for cans, the Omega nozzle, is molded of linear polyethylene. It features a series of projections in the nozzle. These align with matching notches on the can top to prevent the nozzle from twisting or turning during the capping operation. High-speed capping equipment can apply the new nozzle. The maker can supply it with a variety of optional features such as molding it with a seal across the top to eliminate the need for a liner in the cap and to protect against evaporation of contents. It is also available with an invertible spout which a user can pull out. Henlopen Manufacturing Co., Inc., Dept. PE, -Route 110 Farmingdale, L.I., N.Y. (Package Engineering 11;1966;134).

Cellophane, Glassine are most used wrappers
(10/18/66 CI&CJ)

Dime bar wrappers have many advantages over those of nickel bars. The top panel of the wrapper has more square inch area and allows more efficient use of the design elements. It is easier to avoid the impression of crowded design. There is an air of spaciousness, a feeling of quantity and quality and this is true even in those cases where the dime bar wrapper is almost a design duplicate of the five cent, or original version.

Glassines and cellophane wrappers predominate in use for the top dime bars, according to the recent CI&CJ survey. Foils are also in wide use, and a number of products come in paperboard cartons.

In some cases the transparency of cellophane is utilized to permit a view of the product inside; however most bars are coated and greaseproof glassines are used for wrappers. (Candy Industry 127;1966;25.

New Overwrap film needs to coating

An oriented polypropylene overwrap film that gives strong heat seals over a 40 degree range-without aid of coating-has been developed by the film division of Alamo industries, Inc..

The film, OP-400S, is being marketed for overwrapping boxed, trayed and bundled items. Field tests have indicated that it machines and seals under the same conditions as coated oriented polypropylene films. According to the company, the new film has consistent machine formance, clarity, scuff resistance and tensile strength. (Candy Industry 127;1966;19).

Tin-free cans-The containers of tomorrow

Two officials of the American can Company predict that the tin-free steel can will be the metal container of the future. They also state that the firm will eventually convert 90 per cent of its can making capacity to the tin-free can. The chairman announced that the tinfree can first entered commercial-scale production early this year, and that \$ 300 million would be spent to establish tin-free steel capacity in the years ahead. By the end of 1966, he said, they would be supplying part of the brewing industry's need for tin-free cans. (Packaging 9;1966;79)

X8(J58) Oil seed

Area and Production of Oilseeds in India

	Area (thousand hectares)		Production (thousand metric tons)	
	1965-66	1964-65	1965-66	1964-65
	Final	Revised final	Final	Revised final
Groundnut	7171	7216	4022	5888
Sesamum	2456	2513	406	493
Rape and Mustard	2891	2881	1268	1466
Linseed	1764	2059	329	503
Castorseed	356	440	71	108

PART IV.

PERIODICALS - TITLE SERVICE

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F3 Food Technology

USDA Food Research Expected to Benefit Developing Nations

NEW food uses for plant protein-rich **flours** processed from soybeans, peanuts, and cottonseed are being investigated by USDA's Agricultural Research Service (ARS).

Formulas based on these high-protein foods will eventually be made available to developing countries as a guide for using the plant protein that is grown in the area. Technicians from selected countries have been sent to the United States and assigned to USDA's Northern and Southern Utilization Laboratories to learn processing methods for soybean, peanut, and cottonseed flours.

Some formulas or recipes that ARS researchers have developed using these plant proteins are beverages for babies, breads, chapatis, tortillas, vegetable purees, soups and stews, cookies, and other items. (Foreign Agri 4;1966;6).

F3;S1A Food, Aflatoxin

Alarm About Aflatoxin

THE maximum concentration of aflatoxin which is permitted was laid down in August last by a joint advisory group from the Food and Agriculture Organization and the World Health Organization which took into account the urgent need to provide extra protein in some parts of the world, and established a level of 30 $\mu\text{g}/\text{kg}$ of foodstuffs. Clearly the group would have preferred a lower figure, but felt that the danger of malnutrition was greater than the danger that aflatoxin would produce liver cancer in man.

It has been known for some time that aflatoxin produces liver cancer in animals such as pigs, cows, rats, monkeys, and **turkies** (Nature 192, 1095; 1961). What is not known is the extent to which this effect may be duplicated in man. Dr. Rene Truhaut, Director of the Centre de Recherches Toxicologiques in Paris, said that he was not satisfied with the level, or with the means of establishing it. Aflatoxin, he said, was 1,000 to 1,500 times more virulent than butter yellow, a butter additive which is prohibited all over the world. It was dangerous to establish toxic levels for human beings on the basis of experiments with monkeys.

The New International Agency for Research in Cancer was conducting a statistical survey with WHO in countries where liver cancer is common. Primary liver cancer is a tropical disease, so that there is clearly a correlation between the disease and climate; whether there is in fact a correlation between the disease and the presence of aflatoxin in food should be clear from the statistical survey. (Nature 212;1966;1512).

F3,ZEO(D9a) Food, Canning

High-tin Fillet Can

THE American Can Company has been granted a United States Patent on its High-tin Fillet (HTF) metal container. This can was introduced commercially in 1964 and is designed especially for vegetables, such as asparagus, green beans and concentrated tomato products which produce a high degree of detinning.

The patented HTF can features a relatively large fillet of substantially pure tin solder at the **inside** seam of a fully enamelled can. The exposed tin solder and the full enamel coating provide improved container performance and product appearance. The can permits use of fully enamelled cans for two categories of food products which, formerly, could not effectively be used with this type of container: (1) products such as asparagus, which darken objectionably in conventional fully enamelled cans; and (2) products such as green beans, which require use of heavier tin coatings for adequate corrosion service life. (Food Tech Austral 19;1967;166).

F308 Grain Technology

New Grain Institute in Mexico

INTERNATIONAL self-help efforts to increase world food supplies are being supported by the new International Maize and Wheat Improvement Center, whose members met recently in Mexico.

Sponsored by the Rockefeller and Ford Foundations, the research and education center has set its goals to accelerate the rate of increase in corn and wheat production in tropical and semitropical areas around the world.

Among the highly placed representatives attending the meeting were former heads of state and official delegates from the Philippines, Ecuador, Colombia, Chile, Brazil and Thailand. (Foreign Agri 4;1966;14).

F35,ZFR1:xP,C Corn, Fumigated, Stored

Protecting corn in Small-bin Units

A SERIES of four closely related studies concerning small-bin, intermediate type experiments with grain treated with insecticidal materials is under way at the Manhattan, Kan., station of the Stored Product Insects Research Branch, Market Quality Research Div., Agricultural Research Service, U.S. Dept. of Agriculture. The first of the four reports was published in 1965 and covered the use of malathion, synergized pyrethrum and diatomaceous earth as wheat protectants in small bins. The third and fourth will compare the effectiveness of different dosage levels of two diatomaceous earths and two silica aerogels with the standard malathion application in **protecting** wheat; and the protective treatments of grain sorghum.

The second report - recently published by the Agricultural Research Service of the U.S. Dept. of Agriculture - is an "Evaluation of Malathion, Synergized Pyrethrum and Diatomaceous Earth on shelled corn as protectants against insects..... in Small Bins".

Malathion at two dosages rates, pyrethrum synergized with piperonyl butoxide and a diatomaceous earth were applied to uncleaned shelled corn as protectants against insect attack in small bins. The report, made by Delmon W. La Hue of the Market Quality Research Div., showed:

Damaging infestations of mixed populations of insects became firmly established during the 12 mo. of storage in all bins of untreated corn and corn treated with the diatomaceous earth at the rate of 125 lb. per 1000 bushels. Corn protected by the diatomaceous earth had less damage than untreated corn.

The 1.5 per 1000 bu. dosage of malathion emulsifiable concentrate afforded nearly complete protection from insect damage for 12 mo., and the 1-pt. dosage of malathion and the 1-qt. dosage of synergized pyrethrum were only slightly less effective. A marked decrease occurred in the malathion residues during the first month of storage; after that, the decrease was gradual.

The synergized pyrethrum maintained a high degree of repellency throughout the storage period. The piperonyl butoxide residues degraded more or less gradually during the first 6 mo. to a stabilized level, which was maintained throughout the last 6 mo. of storage.

A small amount of diatomaceous earth which did not cling to the kernels fell free of the corn during the filling of the bins. This inert material reduced the test weight of the corn about 35 lb. per bushel. (Am Miller & Proc 95; 1967;15).

F39h:xP,E Bean, Preservation, Packaged

Nitrogen Protection from Bean to Bag

INTRODUCING an inert gas into a package may give the contents a good shelf life but it only provides the consumer with a product as fresh as it was at the moment of packing. In the majority of cases this is acceptable. The peach one buys at the greengrocer's is perfectly edible but those who have picked the fruit from the tree and eaten it will know that there is a wide difference in flavour.

Roasted coffee is a product that deteriorates rapidly. Each grain may contain as many as 1,700 cells which, after roasting and grinding, became charged with carbon dioxide under pressure. The coffee in this state cannot be sealed into an airtight pack for fear of bursting. On the other hand if the coffee is stored until the occluded gas has escaped,

oxygen in the air attacks its complex flavouring constituents before it is packed. An article in the December issue of PACKAGING REVIEW by Dr. H. Davidge explained these deterioration processes.

A process has been developed and patented by the Kenco Coffee Co. Ltd., which removes the carbon dioxide and at the same time prevents oxygen from attacking the coffee grains before and after packaging.

As soon as the coffee has been roasted and ground it is fed into large hoppers which can be sealed off to make them airtight. Alternate cycles of vacuum extraction and nitrogen flushing remove the carbon dioxide from the cells and replace it with nitrogen. At the end of the process the containers are filled with nitrogen at a pressure slightly higher than atmospheric so that the cells become plugged with the inert gas.

The containers are then positioned above the filling machine ready for the packaging process. The coffee is filled into bags made from webs of polyvinylidene chloride coated cellulose film made by Otto Nielsen Emballage AS. Three machines are used: a Hamac Hansella Transwrap model 125, a model 175, and a Rovema VP. Between them these produce bags for 4, 5, 6, 8, 10 and 12 oz. of coffee. Output varies from 40 a minute for the 4 oz. bags to 32 a minute for the 12 oz. The machines were modified by the manufacturers to Kenco specifications to allow nitrogen to be introduced into the filling tube. The ground coffee therefore passes directly from the processing containers through the bag making and filling machines and into the bags in a nitrogen atmosphere.

Half hourly samples of bags from the packaging lines are tested in a quality control laboratory. The two main tests carried out are a vacuum test to check for leaks both in a material and around the seals, and an analytical test for oxygen content which must be below two per cent.

Full freshness and flavour are maintained for six months by this process and coffee is said to be comparable to ground coffee not more than one day old. (Packaging Rev 87;1967;20).

F39A;a241:k2 Vegetable, Disease, Prevention

Bathe Fruits and Vegetables to prevent Decay spreading

A hot bath is being prescribed as a cure for the decay organisms that destroy fresh fruit. Agricultural Research Scientists have used hot water baths and hot air treatments on 14 fruits and vegetables without adverse effects to appearance, firmness, taste or over all quality.

The treatments even afford decay prevention from organisms which get under the skin and are not affected by chemical treatments. Even with new treatment serious damage can occur

if air temperature is extreme or if heat-treated raw product is again contaminated.

A one minute dip at 130°F. had good results in controlling scald in Stayman Winesap and Red delicious apples.

Blueberries which underwent a one to two minute dip at 125° did not have a heavy decay loss. Exposing berries to 110° moist air for 30 to 60 minutes also prevented decay.

Citrus was protected from decay with two to four minute water dips at 115 to 120°. Treatment for oranges was five minutes at 129°.

A 50% decay reduction was achieved on cranberries with two and a half minute dips at 125°. This treatment injured late harvested fruits; a treatment of 10 minute dips at 115° was better for late harvest fruit.

Southeastern grown peaches reacted best to treatments of 120° to 129° for three minutes. A hot moist air treatment at 129° for 10 minutes also produced favourable results. Raspberries, strawberries, peppers, and sweet potatoes also were treated and decay prevented. Still to be tested with hot air and water applications are potatoes, chestnuts, figs, mangoes and papayas. (Canner/Packer 136;1967;90).

F39G6,ZF4 Alfalfa, Dehydrated

Japan UPS its use of US Dehydrated Alfalfa

Partly responsible for Japan's growing use of dehydrated alfalfs has been the country's swing toward greater use of grain sorghum in place of higher priced corn in mixed feeds. Over the past 18 months, sorghum has been the lowest priced feedgrain on the world market. However, it is low in xanthophyll, a form of vitamin A. Dehy is a rich source of vitamin A and is also high in protein, making it an excellent companion to sorghum.

When used infeed for layer hens, and product of 70 per cent of the feedgrains and other feed ingredients moving into Japan, the xanthophyll contained in dehy provides the deep yellow color the Japanese prefer in egg yolks. This chemical also produces a preferred pigmentation in broiler chickens. (Foreign Agri. 4;1966;10).

F3Z5Z,ZE Fish, Packaged

Fresh Packaged Fish?

FRESH fish is one of the few foods rarely found in supermarkets and self service stores. It requires skilled preparation, is a short time dead before it becomes unsaleable, and it smells. The white fish authority are trying to overcome these problems all at once by dipping 8 oz and 12 oz portions of thawed sea frozen cod and shelled iced haddock in a poly-

phosphate to prevent drip and packing them in vacuum pouches or overwrapped trays.

Experiments carried out by the Torrey Research Station show that the packs must be kept between 32 and 38°F. A few degrees above the upper limit **may** reduce shelf life to a few hours. As it is the fish must be sold within three days. With these restrictions it is doubtful whether supermarkets will regard fresh packaged fish as a winner or as a bit of a red herring. (Packaging Rev 87;1967;5).

F3Z5Z,ZQL:d2 Fish, Meal, Production

Fishmeal Production and Exports by FEO

Production of fishmeal by the six members of the Fishmeal Exporters' Organization (FEO) in January-August 1966 exceeded 1.8 million metric tons - 264,700 tons above output in the corresponding 1965 period and a record for the 8-month period.

The fishmeal industry is said to be approaching another crisis because of the low world market price for fishmeal; heavy competition from soybeans, high protein corn, and synthetic acids; undercapitalization; and increasing costs of production.

Country	Production		Exports	
	1965	1966	1965	1966
	1,000 metric tons	1,000 metric tons	1,000 metric tons	1,000 metric tons
Angola	26.6	27.8	30.1	27.9
Chile	50.8	171.1	56.0	132.9
Iceland	85.2	100.2	80.5	98.7
Norway	232.8	327.5	147.5	155.7
Peru	893.0	969.6	1,076.1	945.3
South Africa	249.9	233.8	154.8	102.3
Total	1,538.3	1,830.0	1,545.0	1,462.8

(Foreign Agri 4;1966;14).

J:4386:634 Insecticide

Cockroach control

SUCCESS with which cockroaches have maintained themselves as pests of the food industry derives partly from their knack of keeping out of sight and partly from the speed with which

they are able to develop resistance to the organochlorine compounds and to certain of the organophosphorus insecticides. Effective control needs the application of insecticides which will penetrate their hidden harbourages and provide insecticidal deposits on surfaces on which cockroaches run.

To deal with this difficult pest, Bayer AG and Rentokil Laboratories Ltd. have combined their knowledge and experience in making available a new range of insecticidal products called insectrol, which contains the carbamate insecticide arprocarb (the British Standard common name for the compound, 2-iso-propoxyphenyl-N-methyl carbamate), which was developed in the research laboratories of Bayer AG, Leverkusen, and was formerly known as Bayer 39007.

In addition to the properties of quick knock down and persistence, arprocarb has a highly effective "flushing action". (Food Manufacture 42;1967;51).

J381 Rice

World Rice Crop Forecast is close to Record

The 1966-67 world rice crop (August-July), excluding communist Asia, is forecast at nearly the 1964-65 record level. Record acreages are in prospect in all continents except Europe, and owing to generally favourable weather and improved production techniques, yields per acre are higher in many countries.

World production of rough rice is forecast at 171 million metric tons, up 8 per cent from the short 1965-66 crop and close to the record 172 million tons produced in 1964-65. Average production during the 5 years ended 1964-65 was 160 million tons.

Table - World Production of Rough Rice (Foreign Agri 4;1966;13).

X8(F39s):54 Peanut meal, Export

Indian Team Promotes Peanut Meal Exports

A 10-man Indian delegation has left for East European countries and the USSR to explore the possibilities of increasing exports of peanut meal to those countries. The delegation also will visit West European countries.

Members of the delegation have formed a consortium and already have exported 130,000 metric tons of peanut meal this marketing year, which began in October 1965. Foreign exchange earnings from these exports were about 60 million rupees (£ 8 million).

Indian exports of peanut meal have picked up considerably since devaluation of the rupee on June 6, despite an export duty of 125 rupees (£ 16.67) per metric ton. The export price for

... in September was around 655 rupees (\$87.33) per ton, P.O.B. Bombay. About 200,000 tons reportedly had been sold during the June-August period, including 85,000 tons to the United Kingdom and the continent, 70,000 to Japan and about 45,000 to East European countries. Exports during calendar year 1966 may total around 750,000 tons, about the same as the 1965 level. (Foreign Agri 4;1966;14).

X8(F39T3):54 Coconut products, Export

Philippine Exports of Coconut Products

Registered exports of copra and coconut oil from the Philippine Republic during January-September 1966 totaled 671,747 long tons, oil equivalent basis-26 per cent above the 534,901 registered in 1965.

Exports of copra totaled 697,982 tons compared with 583,067 in 1965. Exports of coconut oil totaled 225,039, compared with 161,738 last year.

Exports of desiccated coconut during September 1966 totaled 8,404 short tons. January-September exports were 51,843 tons, 510 tons below the same period a year ago. Of the total, 70 per cent moved to the United States compared with 78 per cent in the first 9 months of last year.

Table-Philippine Registered Exports of Copra and Coconut Oil (Foreign Agri 4;1966;20).

Philippine Exports of Copra, Coconut Oil

Registered exports of copra and coconut oil from the Philippine Republic during January-August 1966 totaled 591,428 long tons, oil-equivalent basis, 34 per cent above the 442,710 registered in 1965.

Exports of copra totaled 616,332 long tons compared with 473,807 in 1965; export of coconut oil totaled 196,976 compared with 139,474. (Foreign Agri 4;1966;12).

Philippine Exports of Desiccated coconut

Exports of desiccated coconut during August 1966 totaled 8,056 short tons. January-August exports were 43,439 tons, down slightly from the same period a year ago. Of the total, 70 per cent moved to the United States compared with 78 per cent in the first 8 months last year. (Foreign Agri 4;1966;13).

X8(F3Z5Z,ZQL):54 Fish, Meal, Export

Peru's Exports of Fishmeal and Oil

PERUVIAN exports of fishmeal in the first half of 1966 totaled 646,720 metric tons, compared with 915,464 in the corresponding 6 month period a year earlier. Exports of fish oil (excluding

marine mammal oil) during the same period were 28,418 tons against 96,607 in the January-June period of 1965. (Foreign Agri 4;1966;12).

X8(J):94 Agriculture, Safety measures

Review of the Present Safety arrangements for the use of Toxic Chemicals in Agriculture and Food Storage

The Advisory Committee on Pesticides and other toxic chemicals has found that the voluntary pesticides safety precautions scheme has worked remarkably well, but it cannot be as comprehensive as the circumstances require. The British Government should have powers to act rapidly and effectively if the need should arise. The principal manufacturers of pesticides in Britain now support this conclusion.

The Committee recommends that it should be made an offence to sell, supply or import any pesticide product for use in agriculture, gardening or food storage which has not been licensed by the appropriate government department. Pesticides would be tested for mammalian toxicity, carcinogenicity, residue persistence and effects on reproduction and on wild life. It would be for manufacturers applying for a licence to vouch for the safety of their products. The Advisory Committee considered and rejected the possibility of providing an independent check by government laboratories, largely on the grounds of expense. (Nature 213;1967;543).

X8(J582):54 Coconut Export

Ceylon's Exports of coconut products

Exports of copra and coconut oil from Ceylon during the first 8 months of this year declined 22,009 long tons, or 30 per cent (oil basis), from January-August 1965.

Exports of copra totaled 10,596 tons, compared with 20,074 in 1965. Exports of coconut oil totaled 44,039 tons, compared with 59,982 a year ago.

Exports of desiccated coconut totaled 27,291 tons, against 30,887 last year. In the January-August 1966 period the United Kingdom took 11,567 tons, or 42 per cent of the total shipments.

Table: Ceylon's Exports of Copra and Coconut oil

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PART III. TECHNICAL NEWS BRIEF

F3:XP,FE Food, Freeze-drying

FREEZE DRYING DEVELOPMENT

Freeze drying was conceived some 20 years ago to overcome the disadvantages associated with conventional drying and dehydration processes. The food is first snap-frozen and water is then removed by vapourizing the ice crustals in a vacuum chamber. In this way, the appearance, texture, and flavour of the food are preserved. The cost of freeze drying is quite high, typically about five cents per pound. At present, it is being used for expensive foods such as mushrooms and strawberries and for army rations and similar supplies where weight reductions of upto 75 per cent are of prime importance.

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reducing the drying times in the chamber has recently been invented by Mr. J.D. Mellor of the CSIRO Division of Food Preservation, North Ryde. The method could lead to significant cost reductions.

In conventional freeze drying, the drying rate drops sharply as soon as an outer layer of the product has dried.

The outer layer reduces the heat flow to the ice crystals inside it, diminishing the rate at which they vapourize, and hinders the escape of water vapour. In the method invented by Mr. Mellor, gas is admitted to the vacuum chamber when this condition occurs. The conductivity of the outer layer increases as it is permeated by gas and crystals are therefore vapourized more rapidly. The gas is then pumped out and flushes water layer. By repeating these variations in gas pressure throughout the drying method, a reduction in drying time of up to 50 per cent can be achieved.

Arrangements have recently been concluded with the firm of James Rudge Pty Ltd., Alexandria, New South Wales for the commercial development of the process. In the first instance, the firm will construct prototype equipment for demonstrating and exploring the possibilities of the new method. (Food Tech Austral 19;1967;261).

FB;eF31 Food, Flavours

MICROFLORA HELP DEVELOP DESIRABLE FOOD FLAVORS

That the microflora of foods can induce "off" or undesirable flavors is common knowledge. But microorganisms can also have an important part in the development of characteristic and desirable flavors. The "gamey" flavor of birds originates with the metabolism of the caecal flora, and subsequent diffusion of their metabolic products into the muscles of the bird during hanging or ageing after slaughter. The nature and degree of the flavor changes can be affected by the diet of the bird prior to killing it.

Flavor of cheese is mainly due to the starter used, and its characteristic quality. Lactobacilli are mainly involved and other flora and milk enzymes play only a minor part in cheese maturation.

Beer and cider flavors are affected by the strain of yeast used in fermenting them and its tendency to form esters, fusel, oils and diacetyl. The fermentation conditions also play a part. (Journal of Applied Microbiology 29(2);1966;217. (Food Engin 39;1967;131)).

Food, Protein

PROTEIN CONCENTRATE PROCESSES

Reported to be essentially the same as the process developed by the Fisheries Research Board at Halifax, N.S., and published

In 1957, a new process recently announced by the U.S. Bureau of Commercial Fisheries is said to be suitable for scale-up for the bulk production of fish protein concentrate - Fish flour. Similar in appearance to wheat flour, but containing 96% high quality protein as against the 13% protein content of wheat flour, fish flour is suitable for incorporation into bread, breakfast cereals and other cereal containing foods and, as a nutrient, has been shown to be comparable with egg albumin and superior to casein.

In the Halifax process, which allows the manufacture of a variety of qualities from a variety of raw materials, normally cod and herring, the raw material in the form of whole fish, fillets, line scraps, etc., is first ground and mixed with isopropyl alcohol. Sufficient polyphosphoric acid is then added to bring the pH to 4.5 to 5.5, and the slurry finely ground and passed to an extraction kettle in which it is heated for 30 min during which time it is continuously stirred. The slurry is then centrifuged and the cake mixed with isopropanol. This mixture is then returned to the kettle for a further 15 min. of heating and stirring after which it is recentrifuged.

The cake is once again mixed with isopropanol and returned to the kettle for a final 15 min. of heating and stirring. The cake from the final centrifuging is dried at a temperature of 100°F and then ground as a flour.

Suitable for addition to bread in percentages up to 10% of the flour used, and also an ideal additive for special diets indicated for medical reasons; the ability to manufacture this material in bulk may offer a solution to the problem of supplying protein to that large part of the world's population that remains undernourished. (Brit Chem Engin 12;1967;175.)

F39H,ZFC:xP,E0(D9m) Fruits, Frozen, Packaging (in) Pouches

FROZEN FRUITS IN POUCHES

Green Giant Co., Le Sueur, Minn., is test marketing frozen fruits in quick-thaw pouches. Product line consists of strawberries, blueberries, red raspberries, peaches, and mixed fruit.

Quick-thaw pouches reportedly seal in flavor and freshness and reduce defrosting time 25%. (Food Engin 39;1967;27).

F39R1 Tomato

SCIENTISTS DEVELOP NEW TOMATO PROCESSING METHOD

A chemical treatment that makes it possible to process tomatoes into products of practically any desired consistency-from thin juice to firm gel-has been developed by US Department of Agriculture scientists.

Consistency contributes to the quality of juice, catsup, and most other tomato products.

Commercial processors now control consistency by applying heat when the tomatoes are crushed. Heat prevents the enzymatic action that otherwise would break down the pectic substances that give tomato products their consistency.

In one experimental variation of a method developed by chemists in USDA's agricultural Research Service acid does essentially the same thing that heat does in the commercial process. The acid also stops enzymatic action and permits even better control over a wider range of product consistency than is possible with heat treatment.

Dr. Joseph R. Wagner and Jackson C. Miers developed the controlled acidity treatment at ARS' Western utilization research laboratory in Albany, Calif.

They crush tomatoes at the desired level of acidity by adding small amounts of acceptable acid or alkaline amounts of acceptable acid or alkaline ingredients. By adjusting the acidity level, they can obtain a product with practically any desired consistency. After obtaining a product with the desired consistency, the scientists restore the original acidity level. The net effect is about the same as adding common salt.

A higher yield of tomato product from any given amount of raw tomato is an apparent "bonus" of the acid treatment. Test results indicate a yield about 1 percent higher than that obtained by present commercial processing methods.

Besides its potential value in processing, the acid treatment is useful in analyzing tomatoes for both processing quality and "consistency potential". (Canning Trade 89;1967;53).

F3Z1,ZE0(D9a) Meat, Canned

NEW METHOD TO INHIBIT CANNED MEAT CORROSION

With the cooperation of two major meat packaging concerns American can Company scientists have developed an approved method for use of a corrosion inhibitor for water processed canned meats.

Hot water processing of large cans of meat, often lasting as long as nine hours, brings together a number of corrosion forces, such as oxygen, water high temperatures and electrolyte (salt and impurities) in the water. These combine to act on the container with resulting rust spots that detract from the sales value of the meat and in some cases, render the product unsaleable.

The new method which consists of applying sodium nitrate to the processing water has received approval from the Meat Inspection Division of the US Department of Agriculture.

It is claimed that the addition of sodium nitrite to the water not only retards the formation of rust on meat containers during processing but also during subsequent warehousing and storage. In addition with continual usage, sodium nitrite protects retort baskets and tanks from corrosion.

As the result of a number of experiments, it has been determined that a concentration of 600 parts per million of sodium nitrite in process water prevents external corrosion under the most severe processing conditions.

Details of the new method are available in a three page **sheet** from E.L. Brooks, Food Packaging, American Can Company, 100 Park Avenue, New York, New York 10017. (Food Tech Austral 19;1967;267).

F3Z1,ZSJ-ZFJ-ZEO(DH) Meat, Cooked, Cured, Vacuum packed

SAFETY OF VACUUM-PACKED COOKED CURED MEATS

Investigations on the hazard of welchii food poisoning in pasteurized, vacuum-packed, cooked, cured meat products showed that the pasteurization procedure caused rapid germination and loss of heat-resistance in the spores of the bacteria causing welchii poisoning. This indicated that a repeated pasteurization procedure might afford some protection against this type of the food poisoning. Recent investigations with various types of the bacteria causing botulism have shown that a pasteurization treatment in the presence of salt does not cause all the spores of these bacteria to germinate and lose their heat resistance. Many spores remain dormant for long periods. It thus appears that repeated pasteurization of vacuum-packed, cooked cured meat products will not be an effective safeguard against butulism. (Food Tech Austral 19;1967;215).

F3Z5Z:d2,A Fish, Processing

SKIPJACK TUNA HEADING MACHINE DEVELOPED

A Skipjack Tuna heading machine has been developed in Japan recently. The Machine, it is reported, process fish at the rate of 22 fish per minute or about three time faster than a person could do manually.

The machine, constructed of aluminium alloy, is 110 inches long, 55 inches high, 46 inches wide, weighs 880 pounds, and is powered by a 2-horsepower engine. The diameter of the steel blade is 12 inches. A chain conveyor system feeds the fish into the header. The machine is offered for sale at 270,000 Yen. (Indian Seafoods, 4;1967;19).

NEW EGG PRODUCTS

Recipes, methods of production, and results of limited test marketings are given for four new convenience egg products. Included here are results on instant frozen french toast, hard cooked egg rolls, chiffon pies, and frozen western egg.

Researchers suggest that the way to increase egg consumption is to change the form, to make it more convenient, and eliminate "the time, fuss and muss" required for normal preparation.

This reviewer has long held that the ideal for new product development is in the industrial segment of the poultry industry, but these authors are to be complimented for their efforts, in the absence of others for their concerted industrial approach to this problem) - Baker, R.C., L.B. Darrach, and J.M. Darfler, Poultry Science, 45;1011-1017(1966);Cornell University, Ithaca, N.Y. (Poultry Tribune 73;1967;87).

F3ZG81:xP,E Coffee, Packaging

NEW COFFEE PACKAGE: BAG-IN-CARTON

Continental coffee Co. is using a vacuumized bag-in-box to introduce its product to retail buyers. Package (Container Corp. of America) comprises a mylar-and-foil pouch in a zip-open paperboard carton. Brick-hard pouch has a convenient tear-notch. Opening the pouch breaks the vacuum and restores contents to free-flowing form. After use, foil bag can be easily folded and made air-tight, preserving freshness of remaining product. Advantages of Cekavac package over rigid container include lighter tare weight and lower cost. Ceka system enables pouch and carton to be constructed, filled vacuumized, sealed, and packed on a single machine (313). (Food Engin 39;1967;27).

J:4386:634 Insecticide

FLUORESCENT INSECTICIDES TO MEASURE EFFECTS OF SUCH CHEMICALS ON INSECTS will be developed under a three-year grant from the US Department of Agriculture to the University of Georgia. The project, directed by Dr. Chester M. Himel, may provide better insights into insect resistance to insecticides. In recent years, insects have developed varying degrees of immunity to some of the older insecticides. Thus, the scientists are hoping to develop highly fluorescent phosphate and carbanate forms of insecticides which can be traced through an insect's body. This technique, if successful, will provide a new and much more sensitive way to determine how insecticides kill insects or interfere with vital life processes. (Chemical Engin News, 45;1967;43).

1.3 Packaging

NEW ADHESIVE LAMINATES OPP TO PAPER AND BOARD

A new adhesive called disprolac has been developed by the Walpam Co. Ltd., Walpamur Works, Hollins Road, Darwen, Lancs for use on laminating machines to laminate orientated polypropylene film to paper board and other films. Disprolac is a two-component adhesive containing isopropyl acetate. It has good spreading, drying and transparency properties and forms a wrinkle-free bond.

The manufacturers claim that when disprolac is used with opp film a laminate competitive in price with cellulose acetate laminates is produced. Two reasons for this are the high coverage of the adhesive (tests have shown that a yield of from 15-20 gm/sq.m wet coating can be obtained without losing the gloss) and the small amount of heat required for laminating. Disprolac is supplied in standard 5 gal drums but 1 and 40 gal drums are also available (Packaging Tech 87;1967;15).

DRY CELLULOSE FILM SEAL BETTER

Cellulose packaging films must contain a certain amount of moisture to improve their flexibility. Does this moisture affect their performance as packaging materials in other ways?

Recent work carried out at Leatherhead by the Printing Packaging and Allied Trades Research Association shows that it can.

The findings are contained in a report entitled "The effect of relative humidity on the heat-sealing of cellulose film MSAT", by J.H.J. Stocker; P.A.T.R.A. Packaging Lab. Report No.36.

Consequently film users need to adjust the dwell time and temperature of heat-sealing machines to achieve the strongest seals possible in the circumstances. P.A.T.R.A.'s investigation gives the basic information needed for this type of film, together with data on the effects on seal strength in jaw width and of various humidities encountered after sealing. (Food Tech Austral 19;1967 259).

RIGIDITY OF PACKAGING FILMS

When a new type of packaging film appears on the market, and a firm decides that it will make the right wrap for their product, settings on the packaging machine will most likely have to be altered to achieve good wrapping performance.

Different stiffness in the new flexible film can make this necessary. Film stiffness measurement must therefore be a part of any prediction of alterations to machine adjustments.

P.A.T.R.A. in England has been comparing three methods of measuring stiffness to discover their suitability and has just published

The results of their studies in a report entitled "Methods for measurement of the rigidities of packaging films" by D.J.Hine and G.M. Stocks; P.A.T.R.A. Packaging Laboratory Report No.37.

The report first discusses whether stiffness (the property sensed by bending a specimen between finger and thumb) can be converted to an elasticity figure. It then compares three tests for the information given - the familiar Taber test, tensile testing on the Instron machine and a dynamic flexural rigidity method. In this test a sample is clamped at one end and excited into vibration by an alternating electrostatic field from two condenser plates. (Food Tech Austral 19;1967;259).

NEW ADHESIVE FOR HIGH-SPEED CARTON GLUING

It was a case of third time lucky for Chiswick products Ltd., when they tried to find an adhesive that had the required setting, slip and adhesion properties to glue cartons on a Bobst forming machine at a speed of 600 a minute. Chiswick Products make and pack a wide range of products and the installation of the high-speed Bobst machine meant the required adhesive had to have rapid tack to keep pace with it, sufficient slip between bonded surfaces for the machine to achieve perfect alignment of case seams, and had to give a strong bond. It also had to be odour-free and clean and economic in use.

The adhesive finally adopted was polyvinyl acetate emulsion based adhesive specially developed for the purpose by Association Adhesives Ltd., Knights Road, Silver Town, London E.16. This adhesive, EE 9431, met all the requirements and clean-running properties enabled the Bobst machine to be run for long periods without being stopped for cleaning and thereby delaying production.

The development of EE 9431 followed unsuccessful attempts at using heated jelly glues that produced severe stringing and webbing, and synthetic resins emulsion adhesives which did not allow sufficient slip at the required speed and were not bonding strongly enough. (Packaging Tech 87;1967;27).

PAPER COAT

Papercoat, Prop: RKS Industries Private Limited, has started their new paper Converting Plant at Wagle Industrial Estate, Thana. In this unit, at present they will be manufacturing Embossed Leatherette, Fancy, Marble, Flint, Industrial Wrappers and Wax Coated papers. However, within a short time, they intend to install Multipurpose coating and Laminating machine and Rotogravure Printing machine to cater to the increasing demands in the country of Pharmaceutical, Food and all types of flexible packaging. Under the able administration of their technical director Mr. Prem Kapoor who is an expert in these lines, "PAPERCOAT" will be a consolation for the consumer industry. (Perfectpac 7;1967;33).

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PART III. TECHNICAL NEWS BRIEF

J3896

CASHEW PRICES SUBSTANTIALLY HIGHER

The pressure of a smaller 1966 crop of cashews in both India and Eastern Africa (down 10,000 short tons from the 90,000 ton 1965 crop in India and 32,000 tons below the 132,000 ton Mozambique crop) has contributed to substantial price increases in both the kernel and raw nut markets.

9
Raw nuts rose to \$ 229.71 per short ton, c.i.f. New York, on July 1 - the highest on record. Kernels also rose to an unprecedented level of 79¢ cents per pound, c. & f. New York May 1, only to drop back by July 1 to 71 cents - still a high level. This crop was attributed to Indian Packers' refusal to honor Russian contracts on rupee accounts as a result of devaluation of the rupee in June. U.S. purchases on dollar contracts, however, were not affected. In July, the USSR agreed to increase the rupee value of their contracts by 47.5 per cent. This allowed a resumption of Russian purchases, and prices again rose to 75 cents in late July.

Another contributing factor to the rising raw nut market is the increasing competition from mechanized East African shelling industries for raw nuts. This has become a significant factor only during the current season, as these industries have just begun to come into full production. The kernel market has received an additional boost from the sharply increasing demand for shelled cashews - particularly from the USSR, whose purchases rose from 10,000 short tons in 1963 to nearly 15,000 tons in 1965. (Foreign Agriculture 4(38);1966;12).

J582

ECAFE RESEARCH UNIT FOR COCONUT

The ECAFE conference in Tokyo adopted a resolution for the establishment of an international research institute for the coconut industry in Manila.

Indonesia, India, Ceylon, Malaysia, and the Philippines were the sponsors of the resolution. The Institute is to be patterned after the International Rice Research Institute of the Philippines (Oils and Oilseeds J 19(10);1967;16).

J:3:8

INDUSTRIAL STORAGE SILO

A brochure featuring a new design of industrial storage silo has been published by Edenhall Concrete Products Ltd., Penrith, Cumberland. The silo is based on a pre-fabricated system and can be erected in only 10 to 12 days. It is suitable for storing minerals, chemicals, rubber, plastics, cement, gravel, sugar, dry grain and similar materials. (Chem & Ind No.16;1967;633).

J:4:634

PORTABLE PESTICIDE RESIDUE ANALYSIS KIT

Midwest Research Institute of Kansas City, under a contract from the Department of Agriculture, has developed a portable kit for analysing pesticide residues in food crops. The kit is designed for analysis in the field or on the food processing line. (Food Manufacture 42(4);1967;48).

KEEPING THE BUGS OUT

Millers and grain processors are always in the market for devices to keep the bugs out of their raw and finished products. A series of tests conducted by the West Virginia Pulp and Paper Co., New York, N.Y., indicates that maximum protection against insect infestation is provided by that company's Pinch-Pack bags.

Westvaco's Bag Div. reports that, in the tests, its hot melt adhesive-sealed-insect repellent Pinch-Pak bags were compared with untreated cotton bags. In one shipment 56% of the cotton bags were infested, while only 1% of the Pinch-Pack became infested.

The company has conducted three tests to date. The first examined the strength of both Pinch-Pak and sewn bags; the second dealt with the cost of closing materials for both; the third covered protection against insect infestation. Copies of all three reports are available. (Amer Miller and Processor 95(4);1967;15).

TOLERANCES FOR INSECTICIDE RESIDUES

A petition was filed with the food and drug administration by Ferguson Fumigants, Inc., Hazelwood, Mo., proposing that the food additive regulations be amended to establish food additive tolerances for residues of inorganic bromides resulting from fumigation with a mixture of methyl bromide and ethylene dibromide on a number of food products, including some made from grain.

The FDA, after evaluating the petition, has amended the regulations to allow 125 parts per million of the inorganic bromides in or on cereal flours and related products, macaroni and noodles, bread mixes, soya flour, and flours of barley milo, oats, rye and rice. Different tolerances are specified for other food products. (Amer Miller & Processor, 95(4);1967;14).

F3,ZF4

MEASURING COLOUR OF DRIED FOODS

The Southern Utilization Research and Development division of the U.S. Department of Agriculture have developed a rapid and reproducible method for measuring the colour in dried foods. Dried food samples are placed between thin discs of Teflon in a steel die. The die and its contents are evacuated and then quickly flattened out to produce a wafer of dried food with a smooth surface. The colour of the wafer is then determined from transmittance reflectance spectra. (Food Manufacture 42(4);1967;48).

ANAL. TECH. QUES

The current issue of Beckman Instruments quarterly house magazine 'The Analyser' states that American Scientists are studying the problem of how long plants, such as fruit and vegetables, continue to 'breathe' after they are harvested.

Understanding, and measuring, the respiratory activity of plant tissues, is of importance in the development of modern storage, transport, and packing techniques for preserving the freshness of perishable goods.

The open (gas flow) system of measuring respiratory gas exchange has the advantage of avoiding excessive depletion of oxygen or accumulation of carbon dioxide or other metabolically active volatile gases, which emanate from respiratory tissues, and which may alter the respiration rate when determined in a closed system. In a current series of studies, scientists at Michigan State University monitor a large number of fruit and vegetables over a period of a week or more to assess their intake of oxygen and CO₂ evolution in an open system. The analyser employed to measure the gaseous exchange of CO₂ and O₂ during respiration are two Beckman instruments: an IR-115 infrared carbon dioxide analyser and a Model G-2 oxygen analyser. Information derived from these studies is being supplied to programmes that extend across the full spectrum of produce technology from growing, through shipping and storage, to final handling in the grocery market.

Beckman Instruments Ltd. is at Glenrothes, Fife, Scotland.
(Chem & Ind No.16;1967;632).

F3Zm:xP,E

SIMPLE CHEESE PACKING

The new Exacto rindless cheese packaging machine has been built with the emphasis on simplicity of design, and is therefore easy to maintain and operate even by unskilled labour.

The machine is self-contained and only requires connecting up to the electrical power supply before using. The stand is of welded, tubular steel fabrication accessible for easy cleaning, and the legs are provided with plates drilled for securing to the floor, though this is not necessary. The thick steel table plate is covered with stainless steel, eliminating all crevices where wax or dirt could collect.

Mounted on this table, the actual swan-necked press brackets are of strong cast iron constructed to take a load far in excess to that ever required. The upper brackets are supported by a set situated on the underside of the table plate. The latter take the counter pressure when the press is operating and also hold the lower totally enclosed heating element. For stainless steel vertical shafts guide the top platen in its movements. The platen of the ram is electrically heated; the whole unit being totally enclosed.

chrome-plated bronze links secured to the centre of the ten are fitted with a handle for lifting or lowering on changing from a 20 lb. to a 40 lb. cheese, and vice-versa. The only other adjustment needed for this change-over is the removal and insertion into another position of a self-locking pin.

Hinged on one side is the aluminium cheese mould. Electrical elements on all plates are completely enclosed. The mould is firmly locked by means of a quick locking chrome-plated lever construction. On opening, the hinged side is "kicked" open by the lever action, and a slight push with the left hand on the extra handle provided swings the mould open. The cheese passes easily in and out.

The ejector on the rear mould plate is actuated by the black hand lever knob on the right hand side. A handoperated hydraulic pump, fitted with a set pressure valve, makes it impossible to obtain a higher pressure when pumping. Machine parts and guages can therefore not be damaged. The machine is manufactured by Exactocraft, P.O. Box 2432, Cape Town. (Food Ind S Afr 19(10);1967;39).

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E92Z:3C5 Amino acid, Analysis

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PART III. TECHNICAL NEWS BRIEF.

F3;9U Food, Flavour

IMITATION FLAVORS HAVE BRIGHT FUTURE

CHICAGO-The future use of natural flavors, is "going to be increasingly curtailed by their lack of versatility", C. Richard Myers of Firmenich & Co. told a joint meeting of the Chicago sections of the American Association of Candy Technologists and the Institute of Food Technologists.

"Imitation flavors will be increasingly important in future food innovations", he said. "Their versatility assures them a prominent place" in the future.

"We as suppliers can help you develop foods that look, smell, feel, taste, and in some cases sound (snap, crackle, pop) like your marketing people think they should," he said.

Exploring a number of "New and interesting (theoretical) approaches to present flavor problems" he described: (Candy Industry 128;1967;6).

HIGH-PROTEIN FOOD

A Norwegian food-processing firm has developed a canned high-protein fish paste which, according to the Norwegian Agency for International Development, can be processed into food for food-deficit countries.

The product is based on herring with skimmed milk and fats added and contains 2,500 calories per kilogram. The firm that developed the paste claims that it can be produced for 35 cents per kilogram and that on a mass production basis the cost can be reduced even further. (Foreign Agriculture 5;1967;10).

F39H:xP Fruits, Preservation

KEEPING FRUIT FRESH LONGER

Fruits stay fresh longer and resist mould infection better by a new technique of regulating the 'breathing' of their skins developed by a British scientist.

Dr. Henry Hurst, managing director of a Cambridge timber-proofing company, has spent years on research into the structure of insect and plant skins to show that if the skin of fruit is stabilized by a simple chemical process the resistance to variations of temperature and humidity, mould infection and bruising is greatly increased.

The stabilizing agent is a colourless, tasteless liquid which is cheap to make, and application is a simple matter of bulk dipping in the warehouse.

Successful tests have been carried out with lemons, grapefruit, oranges, tangerines, bananas and other fruits. In these, Dr. Hurst has established that the rate of ripening and decay depends on the reaction of substances in the skin, and that if this "breathing" can be slowed down the fruit will ripen more slowly, keep longer and be more resistant to temperature changes.

A ripe, stabilized banana, for example, can stay firm and edible for up to four days at 34°C, while an untreated one softens after 3 to 16 hours. In average room temperature, according to Dr. Hurst a treated banana should stay firm about 10 times longer than normal.

Dr. Hurst claims that his treatment could be of great value as fruit can be stabilized at any state-after harvest, during ripening, or before selling in containers. (Planters' Chronicle 62;1967;219).

F3ZA5 Mushroom

USE OF MUSHROOMS AS MEAT SUBSTITUTE SUGGESTED

CHICAGO, Ill. — Dr. A. Karler, of the meat packing firm of Wilson and Company, recently described how mushrooms could be ground and cooked in patties which have the same texture as cooked ground beef.

... to the American Chemical Society, he noted that ... in calcium and vitamins, lower in fat, ... in protein to meat, adding that the mushroom product cooks more evenly at low temperature and in less time than meat.

The mushroom substance, now in the development stage, will probably be used first as a meat extender in ground beef, which will reduce the price without lowering the food value.

Dr. Karler stated that, if the mushroom product process were given high priority, its use as an extender for ground meat could be in general use by the end of this year, and within a few years, would stand alone as a separate food item. Estimated cost would be 2¢ per pound. (Canadian Food Industries 38;1967;20).

F3ZG51,3 Tea, Instant

INSTANT TEA

Two factories with a total capacity of about 770 tonnes, have been established in Kerala for the manufacture of instant tea. The entire output is intended for export but the factories have yet to start production on a commercial scale. Government propose to watch their production and export performance for some time before considering any new proposals for setting up more factories to manufacture instant tea. (Planters' Chronicle 62;1967;238).

J:4:6 Insect, Control

INSECT CONTROL

A new concept of continuous insect control without spraying is being introduced to the UK consumer market this spring. This new product, Vapona Strip, has been developed by Shell in the United States. It is a 10 in. PVC strip which releases minute quantities of vaporising insecticide for a period of three months.

It can be used in the home, factories, restaurant, and so on. Used in greenhouses, the Vapona insect killer controls several important pests of crops including aphids, white flies, leaf miners, mealy bugs and spider mites.

The PVC strip incorporates 19% by weight of the Shell insecticide Vapona (equivalent to 17.7% weight of dichlorvos (o,o-dimethyl-2,2-dichlorovinyl phosphate). (Chem & Industry No.17;1967;676).

J451

TEA CROP OFF IN CEYLON, UP IN INDIA, PAKISTAN

Ceylon's tea crop for 1966 totaled 490 million pounds, down 13.2 million from the record 1965 outturn. Preliminary estimates place India's production at approximately 830 million pounds, 20 million ahead of 1965. Pakistan's crop also increased in 1966, totaling 62.9 million pounds compared with 59.6 million in the previous year. (Foreign Agriculture 5;1967;15).

SHRINK WRAPPING

A revised version of PATRA's survey of shrink wrapping is now available. As the original report attracted considerable interest from organisations not normally entitled to join the Association, this second version will be on sale to non-members at 25s (cash with order); members of the Association's packaging division may obtain copies free of charge.

The survey examines the claims made for shrink wrapping: it looks with a critical eye at (1) the nature of the process, and the uses to which it is being put; (2) its likely scope, in the light of technical considerations and the potential size of the market; (3) material's and methods in use, and probable lines of advance in the near future (this section includes tables showing the suppliers of machinery, tunnels, trays and ancillary equipment for shrink wrapping, tunnel, specifications and wrapping machine specifications); and 4 comments made during the survey by interested parties and problems which have been encountered.

A new section in the revised survey deals with considerations to be borne in mind when selecting a shrink tunnel; these include pack size, throughout temperature control, heat distribution and ease of adjustment. Two fully automatic lines which have recently been demonstrated successfully are described; one of these wraps cans, the other handles four different products.

Details of materials and equipment developed since the issue of the original report are included in tables together with the earlier information. Comments are also made on the relative merits of shrink wrapping and fibreboard cases for protecting cans against corrosion. (Perfectpac 7;1967;37).

M98 Packaging

MACHINE SHRINKS COATED POLYPROPYLENE SKIN-TIGHT

Coated polypropylene, a plastic film widely used in packaging, can be shrunk skin-tight with a new machine introduced by a British firm. It shrinks the film by two to three per cent, enough to complete an already close overwrap.

The machine applies direct heat to the film. The pack around which the film is wrapped is drawn between two synchronized belts one above the other, the opposing faces of which pass over heated platens. The temperature of each belt is controlled by thermostat and belt running speed is infinitely variable up to about 80 packs a minute.

The top belt can be adjusted vertically to accommodate pack: ranging in size from 12 in. long X 8 in. wide X 4 in. deep to 3 in. X 1-1/2 in. X 1/2 in.

and for use on low-shrink film, which
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Part III. TECHNICAL NEW BRIEF.

F39E1

POTATO DE-STONER

A machine for separating stones from potatoes prior to washing, peeling, scraping or other processes has been introduced by Novotechnics Ltd.

Called de-stoner No.362, it is said to be particularly suitable for potato crisp manufacturers, and also potato pre-packing and peeling.

The machine has a throughout capacity of 10 ton of potatoes/hr. and comprises a 2 ft. 11 in. high, 60 gal. water tank, and a 6 ft. high, 1 ft. 4 in. diameter vertical spiral, which can be varied to suit individual requirements. It is fitted with an outlet door for waste and a threaded outlet suitable for pipe connections. (FP and M 212) (Food Proc Market 36;1967;205).

F39R1

TOMATO PROCESSING METHOD

A chemical treatment that makes it possible to process tomatoes into products of practically any desired consistency-from thin juice to firm gel-has been developed by US department of agriculture scientists. Consistency contributes to the quality of juice, catsup, and most other tomato products.

Commercial processors now control consistency by applying heat when the tomatoes are crushed. Heat prevents the enzymatic action that otherwise would break down the pectic substances that give tomato products their consistency.

In one experimental variation of a method developed by chemists in USDA's agricultural research service, acid does essentially the same thing that heat does in the commercial process. The acid also stops enzymatic action-and permits even better control over a wider range of product consistency than is possible with heat treatment. (Please see for rest of the portion at page No.27)

F3ZA1

FOOD YEAST FROM WASTE

From Moscow we learn that Soviet scientists estimate that more than 3,000,000 tons of food yeast can be produced by utilising the waste materials of the timber and wood working industry as a nutritive medium for micro-organisms. Propagating quickly in this medium they produce great amounts of biological mass which, in turn, may be used for manufacturing human food. Other scientists have suggested that natural gas should be used for "feeding" microbes.

The USSR is planning to build a number of large enterprises which will manufacture a protein-vitamin concentrate of liquid petroleum paraffins and other materials, as well as factories of manufacturing biological agents for agriculture.

Different varieties of meat and even black caviare are already made in laboratories from artificial proteins. It is only under a microscope that these goods can be distinguished from the natural product. Meat is produced as follows; yeast protein is fed into an installation resembling a spinning machine. From it extremely fine streams of extract are pumped into a special solution where they solidify and begin to resemble meat tissues. These tissues are given the colour of beef, pork or poultry and the corresponding flavour and shape. (Food Tr Rev 37;1967;40).

J:4:634

ENTOBACTERIN: A NEW PESTICIDE

One gramme of this substance contains thirty billion bacterial spores and as many toxic protein crystals. Its toxicity seems certain. But it is entirely harmless to man. This is entobacterin-3, a new pesticide.

The leaves of apple trees curled up and were covered with red spots, the blossoms wilted. But then a gardener with a spraying apparatus comes to treat the orchard with the new pesticide. Wouldn't the spraying affect the future crop? No, it would not. It is harmless not only to man, but also to plants at any vegetation stage. Neither is it harmful to birds, and useful insects including bees.

The action of this potent preparation is selective. Usually even after spraying poisonous chemicals the pests are not killed at once and they continue to harm the plants for some time. The advantage of the new preparation is that no sooner it enters the pests' organism they stop feeding. In a few hour after spraying or dusting the orchard is free from pests and no second treatment is required.

Preventive value: Various chemical additives make the preparation adhere to the plant for a few days, thus giving it preventive value as well. By now about 35 species of pests are known to have been killed by entobacterin. Among them are various moths, silkworms and the Colorado beetle. In the case of pests that are resistant to the new preparation it is mixed with the proper insecticides and fungicides which in this form are harmless to man, birds and useful insects.

As to effectivity and action spectrum entobacterin has no equal in the world. Furthermore, it is cheap, being made of inexpensive materials with simple equipment. The consumption of entobacterin is low-4 kg. per acre.

The new preparation has already been successfully used in many agricultural areas of the Soviet Union to control pests of fruit berry and vegetable crops as well as of decorative and park vegetation. The Soviet Licensitorg agency offers the new preparation for manufacture in other countries under licensing arrangements. 'Soviet Features' (Planters' Chronicle 62;1967;272).

J382

WORLD WHEAT HARVEST SURPASSES RECORD

World wheat production in 1966 is now estimated at 274 million metric tons (10.06 million bu.), 7 percent more than the previous record of 255 million tons (9.36 million) in 1964, and 11 percent larger than the 1965-66 crop. The harvest is 18 percent above average production during the 5 years ended 1964.

WORLD WHEAT PRODUCTION

Continent	Average 1960-64	1964	1965 ¹	1966 ¹
..... in million metric tons.....				
North America	49.6	53.6	55.8	59.7
South America	9.5	13.7	8.0	10.6
Western Europe	39.0	43.2	45.4	40.2
Eastern Europe	17.2	18.0	21.9	21.9
USSR	50.0	57.7	46.5	73.5
Africa	5.7	5.9	6.1	4.9
Asia	52.1	52.3	55.6	51.3
Oceania	8.5	10.3	7.3	11.6
Total	231.6	254.7	246.6	273.7

¹Preliminary

record harvest 7 per cent above the preceding year's bumper output. Canada, producing record yields per acre from a record acreage, increased production 30 per cent. The US harvest, though below 1965, was well above average. Argentina's harvest will exceed the poor 1965 crop.

Output in Western Europe decreased by about 5 million from the preceding year. Weather was generally unfavourable for planting and growing of both winter and spring wheat in the Northern countries. Total acreage declined by about 3 million acres; though outturn per acre was above average, the high yields of 1965 were not attained. France, Europe's largest producer of wheat, had the most severe production set back. (Foreign Agriculture 5;1967;11).

J451 PRODUCTION OF GREEN TEA

The quantities of green tea produced in the country during 1963, 1964, 1965 and 1966 were:

		(in '000 kg.)			
		1963	1964	1965	1966
Assam	...	359	432	50	145
West Bengal	..	2872	3132	2548	3349
Tripura	...	168	196	146	230
Bihar	...	60	54	39	44
Uttar Pradesh	...	221	494	378	317
Himachal Pradesh (Kangra & Mandi)	..	934	618	553	696
Total		4614	4926	3714*	4781*

*Provisional

The quantities of green tea exported during the same period were:

(in '000 kg.)

	1963	1964	1965	1966
Afghanistan ...	2084	2310	1378	2191
Other countires	26	23	6	3
Total	2110	2333	1384	2194

(Planters' Chronicle 62;1967;256).

M98 NEW ADHESIVE DEVELOPED BY DISPRO

Dispro Ltd has developed a new adhesive capable of sticking an oriented polypropylene laminated surface to a non-laminated surface. It is confidently anticipated the combination of OPP and the new adhesive will develop and improve carton manufacture, particularly in those fields where outstanding resistance to moisture, heat, grease and solvent is required. In one test the new adhesive was used to join laminated sides of cartons to non-laminated sides and the cartons were placed in an oven for 10 weeks at 70 degrees C. This exceptional treatment only produced a softening of the adhesive. (Packaging 37;1967;53).

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Continued from page No.6.

Tomatoes are crushed at the desired level of acidity by adding small amounts of acceptable acid or alkaline ingredients. By adjusting the acidity level, they can obtain a product with practically any desired consistency. After obtaining a product with the desired consistency, the scientists restore the original acidity level. The **net** effect is about the same as adding common salt.

A higher yield of tomato product from any given amount of raw tomato is an apparent "bonus" of the acid treatment. Test results indicate a yield of about 1 per cent higher than that obtained by present commercial processing methods.

Besides its potential value in processing, the acid treatment is useful in analysing tomatoes for both processing quality and "consistency potential".

(Food Processing & Marketing 36;1967;187).



CENTRAL FOOD TECHNOLOGICAL
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MYSORE

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PART III. TECHNICAL NEWS BRIEF

F32;91 WHEAT, PROTEIN

MAKE HIGH PROTEIN FOODS FROM MODIFIED WHEAT?

CAN HIGH-PROTEIN food products for developing countries be made by fortifying or modifying wheat? Research with this aim was described to cereal scientists by Robert P. Graham of USDA's Western Regional Research Laboratory, Albany, Calif.

Products with 20% protein, Mr. Graham stated, were obtained from whole and cracked wheat coated with low-fat, high-protein safflower and soya flours; the coatings remained intact during cooking. Rolled and drum-dried flakes with 20% protein were prepared to be used as a mush or gruel. (Soybean Digest 28;1967;48).

F3209R WHEAT BRAN

EXPORT OF WHEAT BRAN

The export of wheat bran has increased from Rs. 0.78 lakhs in 1965-66 to Rs. 28.70 lakhs during 1966-67. Singapore is our main market with small quantities going to Dubai and Bahrain. Though

India has been able to boost up her exports of wheat bran considerably, she is facing increasing competition from some of the East African Countries, who are able to offer the product at considerably lower rates. (Profodcil Bull 2;1967;19).

F39H,ZEO(D9a) FRUIT, CANNED

EXPORTS OF CANNED FRUIT PRODUCTS FROM INDIA DURING 1966-67

The total exports of canned and bottled fruits during 1966-67 was worth Rs. 66.58 lakhs of which the Soviet Union accounted for export worth Rs. 38.92 lakhs. For the first time Yugoslavia imported Mango juice and Slices from India valued at Rs. 1.52 lakhs. Kuwait in the Arabian Gulf, has emerged as another important customer for our Mango juice, her off take during the year under review being worth Rs. 14 lakhs.

During the current year, the Soviet Union is expected to import Mango juice and Pineapple juice worth Rs. 50 lakhs, and Kuwait approximately Rs. 40 lakhs worth of mango juice.

Export of fruit products by some of the leading manufacturers during 1966-67 given below (exports worth over Rs. 1 lakh).

	Value in lakhs of Rupees
1. Tims Products Ltd.	18.72
2. Allahabad Canning Co.	14.04
3. Kissan Products Ltd.	9.26
4. D and P Products Pvt. Ltd.	8.84
5. Pure Products & Madhu Canning Ltd.	5.30
6. Darlco Canning	5.17
7. Midland Fruit & Vegetable Prod	1.38
8. Dr. Writer's Chocolates & Canning Co.	1.28

Based on the daily list of exports issued by the Bombay, Calcutta, Madras and Cochin custom houses. (Profodcil Bull 2;1967;19).

F3ZG51:xP,E Tea, Packaging

NEW ITALIAN TEA-BAG PACKAGING MACHINE

The bags which, a comparatively short time ago, were seen only in cafes and restaurants, have fast become a part of the normal merchandising scene. Machinery designed to facilitate the production, filling and closing of tea bags has, therefore, occupied the attention of machinery manufacturers in various parts of the world.

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Industria Macchine Automatiche, of Italy, have developed the IMA C20 which accomplishes the complete operation in one automatic sequence.

The filter bag is produced from a reel of non-heat-sealing filter paper, and is accurately filled by a volumetric filter of new design. The filler is piston operated and weight adjustment is effected by means of a second piston which allows for a very wide weight adjustment range.

The filter bag mouth is then closed by folding of the upper flaps and subsequent stapling, at the same time joining the bag to a tag, fed from a reel, by means of a cotton thread. The filter bag is then enclosed in an overwrap or external envelop which can be crimp closed if required.

The C20 can be used for other products than tea, and has-in-Europe been found effective for the packaging of a wide range of granular or powdered products where single serve packs are desirable.

The output of the C20 is as high as 160 bags per minute.
(Packaging World Digest 10(7);1967; [Packaging 38(448);1967;95]).

KX332 Shrimp

INDIA LEADING IN PRODUCTION OF SHRIMP

World production figures

The total production of shrimp and prawns in the World is 6,30,900 tonnes, according to the figures furnished in the year book of Fisheries Statistics of the FAO for 1964. According to this India became the largest producer of shrimps and prawns with the United States claiming the second place and Mexico claiming the third place. The Production of various countries are given below:

India	95,000
USA	94,100
Mexico	68,900
Panama	7,000
Chile	16,600
Brazil	35,200
Norway	11,000
Netherlands	21,900
Federal R. Germany	28,700
Spain	12,700
UAR	10,400
Japan	78,600
Pakistan	18,400
Burma	10,200
Thailand	29,500
Taiwan	9,800
Rep of Korea	18,100
Australia	6,100
Other countries	59,000
Total	<u>6,30,900</u>

(Seafood Tr J 2;1967;13).

L:573 Nutrition

HIGH PROTEIN MIXTURE FOR BABIES

BABIES LIKE the taste of it. Made from low-cost ingredients available throughout the Middle East, it may provide new markets for U.S. soybeans and chick-peas.

It's the new protein-rich vegetable mixture developed by bio-chemist Karl Guggenheim, Hadassah Medical School of Hebrew University in Jerusalem, Israel, under a Public Law 480 research grant awarded by ARS. Such grants are made from local currencies paid by countries that receive US surplus food.

Guggenheim tested various vegetable mixtures and found the best to be a mixture of 47% steam-heated chick-peas, 35% defatted sesame flour, and 18% heat-processed low-fat soy flour. This mixture has a nutritive value higher than that of any one of its ingredients. It is high in essential amino acids, B-vitamins, calcium, and iron.

Yehuda Matoth, head of the pediatrics department of the Hasharon Hospital at Petah-tiquah, Israel taste-tested the vegetable mixture by feeding 20 infants small amounts mixed with sugar and water to give it the consistency and the calories and protein content of milk mixed with cereal. The infants liked the taste the mixture and suffered no gastro intestinal disorders from it.

Matoth is now feeding infants the mixture as their sole source of nutrients, but these studies are not yet advanced enough for definite conclusions.

Guggenheim fed the mixture to young rats and chickens for 2 years. Protein-depleted rats fed the mixture for 10 days gains .07 ounce in weight for every .03 ounce of protein consumed. For young chickens, the nutritive value of the protein mixture was superior to fish meal, cottonseed meal, and soybean meal.

Guggenheim is continuing experiments to improve the mixture by supplementing it with additional amino acids (Soybean Dig 28;1967;42).

L:5730 Diabetics - FISH DIET REDUCES HEART ATTACKS

Men who ate fish five times a week for lunch and dinner for five years suffered only a third as many heart attacks as men in a control group. The fish eaters 814 men 40-59 years old were members of a New York "Anti Coronary" club who volunteered to take part in a study seeking ways of preventing heart disease. The control group consisted of 403 men of the same ages.

The club members followed a "prudent diet" prescribed by the New York City Department of Health, reports the Departments Dr. Seymour H. Rinzler. They ate much fish, substituted margarine for butter, sherbet for ice cream and soft cheeses for hard. Chicken, veal and lamb were the main meat choices. But one pound of beef or pork was allowed weekly. The rest of the diet consisted of a maximum of four eggs a week, one ounce of oil daily, bread and cereals.

Dr. Rinzler said anti coronary clubs were starting up in many communities. He cited as examples five in New York State, one in Chicago and one in Burlington. (Seafood Tr J 2;1967;30).

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PART III. TECHNICAL NEWS BRIEF

E92Z2 Protein

PROTEIN FROM CRUDE OIL

From information received from Bulgaria, we understand that after two years of research, scientists working in the Chemical Industry Research Institute in Sofia, have obtained protein from crude oil. This protein and vitamin concentrate is especially rich in amino acid. It contains 11 such acids, among them lysine. It also contains a wide range of vitamins B₁, B₂, B₆, B₁₂, PP, etc.

The Scientists have obtained this concentrate from crude oil obtained from the oil deposit near the village of Dolni Dubnik, not far from Pleven. The crude oil from this deposit contains 23-24 per cent of normal paraffins (Twice as much as in the crude oil so far used for this purpose).

In the near future, Bulgaria is to start production of protein from crude oil on an industrial scale. Besides being used for stock-breeding. It will be used as a very concentrated food for human. They will be able to add tablets of this product to cooked food. (Food Tr Rev 37(6);1967;35).

E982 Enzyme

BREAKTHROUGH WITH ENZYME-WIDE RANGE OF APPLICATIONS CLAIMED

A breakthrough in the field of enzyme preparations, applicable to many products, is claimed by the East German Institute for Fermentation and Beverages.

According to Dr. Dickscheit, director of the institute, a number of novel enzymes have already been developed. Some have found application in the production of milk, replacing effective substances which in the past have been imported from Western countries.

Savings to the extent of £1.2m. alone are expected from the introduction of the new preparations into East German breweries and plants producing other beverages.

The new enzymes are said to speed chemical processes and to be of special value in the production of light ale and German Pilsner. They provide for an economic application of raw material and operate as equalisers of vintage, conditioned quality changes.

Application of ultrasonics during brewing has resulted in a substantial increase of bitter yield of hop. As a result, 14 East German breweries have been able to cut their annual intake of 2,500 lb of hops by some 20 per cent.

Construction of a pilot plant for the daily production of 2,000 lb of enzymes for the fermentation and beverages industry is presently being planned. (Food Tr Rev 37(6);1967;36).

F3:XP,FP Food, Preservation, Irradiation

IRRADIATION PRESERVATION OF FRESH FOOD IN CANADA

Experiments with low level gamma radiation at the University of Manitoba, Canada, in cooperation with Atomic Energy of Canada Ltd., have demonstrated that the storage life of fresh food can be extended considerably by irradiation.

Fish was chosen as the medium upon which to experiment. Dressed whitefish in sealed plastics bags was exposed to a low level of gamma irradiation for a short period of time. As a result, 99.9 per cent of the bacteria, which contribute largely to the spoilage of food, were destroyed. The package thus treated could be kept on ice. In a fresh condition, for a period of up to 29 days. Equipment used for the irradiation of samples was a mobile Cobalt-60 gamma irradiation unit designed and constructed by Atomic Energy of Canada Ltd. (Food Tr Rev 37(8);1967;70).

F39s;S1A;bl2;a86 Groundnut, Aflatoxin

AFLATOXIN, THE CANCER-CAUSING AGENT FOUND IN EDIBLE NUTS, HAS BEEN FULLY CHARACTERIZED

As mutagenic and carcinogenic by a team of Food and Drug Administration scientists. FDA's Bureau of Science group, headed by Dr. Marvin

Ligator, says the agent causes breakage at the long arm of chromosome apparently through an alkylating, complex with deoxyribonucleic acid. Dr. Ligator's work, performed with white blood cells and kangaroo rat kidney cells, is the first aflatoxin study on mammalian cells. It complements the DNA complex research on the mycotoxin performed by Dr. A.W. Wogan at Massachusetts Institute of Technology. Aflatoxins' cancer causing properties have thrown scares into the peanut industry which now is effectively monitoring its products. (Chem & Engin News 45(4);1967;33).

F39K2 Grape Fruit

IMPROVED GRAPEFRUIT PRODUCTS NOW POSSIBLE

Improved processed grapefruit products may result from flavour studies, by the US Department of Agriculture, of nootkatone, a powerful flavouring agent that occurs naturally in grapefruit peel oil.

These findings will contribute to a continuing effort by USDA's Agricultural Research Service to make better products from citrus fruits.

Nootkatone, A flavouring material of grapefruit peel oil, is so powerful that one drop can be tasted even when diluted in 25 gal. of distilled water. Nootkatone can also be made synthetically from valencene, a more abundant constituent of orange peel oil.

Working at the US Fruit and Vegetable Products Laboratory, winter Haven, Florida, the scientists found that concentrations of 5-6 ppm improved the flavour of grapefruit juice reconstituted from USDA developed grapefruit crystals. Less than 6 ppm were almost undetectable in juice, and more than 7 ppm imparted an unpleasant bitter flavour. (Food Tr Rev 37(8);1967;70).

F3ZG51 Tea

VITAMIN B COMPLEX IN TEA

It has been stated that Soviet Research Workers have been able to detect certain vitamins, specially vitamin B complex in tea. A news report published in this effect says that this is the first time that tea has been credited with food value, though it has always been considered a stimulant. A detailed paper on the analysis made by the Soviet scientist would shortly be made available to India for circulation, according to the report. (The Planter's Chronicle 62(19);1967;372).

LUMINESCENT TEA

In news received from the USSR, we are given to understand that tea has been found to possess another property that can be used in judging its quality, apart from taste, colour and aroma. This is luminescence in the dark; the luminescence is of a small order and cannot be detected with the naked eye.

A method for assessing the quality of tea by "tea light" has been developed in the Soviet Union. Brewed tea is placed in a dark chamber together with a highly sensitive instrument which detects "tea light". The quality of the tea is assessed by the predominant colour in the "tea light". (Food Tra Rev 37(8);1967;26).

PALLETISATION OF TEA

It is reported in Ceylon that following numerous complaints from Canada and the USA palletisation of tea from Ceylon has been temporarily suspended until ways and means are found to eliminate the presence of a borer weevil which enters the timber from which pallets have been made, at a very early stage. Much concern has been expressed by importers in Canada and the trade in Ceylon is at present investigating methods of treating timber for pallets to prevent them from becoming infested. (The Planters' Chronicle 62(9);1967;372).

X8(F39s,ZQL):535 Oilseed meal, Export

INDIA'S EXPORTS OF OILSEED CAKES, MEALS UP

Prospects for Indian exports of oilseed cakes and meals, particularly de-oiled peanut meal, have improved since devaluation of the Indian rupee on June 6. About 115,000 metric tons of solvent extracted (de-oiled) peanut meal are said to have been contracted for export by Indian shippers since June 6, including about, 25,000 tons to Japan, 75,000 to Western Europe, and 15,000 tons to Eastern Europe. Japan continues to be an enthusiastic buyer, but the United Kingdom reportedly was heavily stocked as of mid-July.

The export deadlock with countries having rupee payment agreements with India has now been lifted, and exports to those countries are expected to pick up. This follows the arrangement arrived at between the Indian Government and the USSR by which Indian shippers have been allowed to mark up their rupee prices by 47.5 per cent on the unimplemented portions of their existing contracts; a 57.5 per cent on the unimplemented portions of their existing contracts; a 57.5 per cent mark up has been allowed communist countries other than USSR (Foreign Agriculture 4(34);1966;13).

X8(J581):2 Peanut, Production

INDIA'S PEANUT ESTIMATE REVISED DOWNWARD

India's 1965-66 peanut production is now placed at 4,022,100 metric tons, in shell basis, according to the final official estimate recently released. This is 32 per cent below the revised official estimate for 1964-65 of 5,887,700 tons.

These estimates represent substantial declines from the previous estimates for 1965-66 and 1964-65 of 4,500,000 and 6,176,000 tons respectively. Except for Uttar Pradesh production was down last year in all the major growing States because of late and insufficient rains.

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According to revised estimates, area planted to peanuts in 1965-66 was 17,720,000 acres compared with 17,831,500 in 1964-65. (Foreign Agriculture 5(32);1966;13).

X8(J684):535 Cardamom, Export

PROSPECTS FOR CARDAMOM EXPORTS

India produces on an average about 80 per cent of the world output of cardamom. It is also the major exporter of cardamom with an export surplus estimated at about 3000 tonnes per year. India's exports of cardamoms during 1965-66 were 1392 tonnes valued at Rs. 4.4 crores, and during June 1966 to March 1967 the exports amounted to 1953 tonnes valued at Rs. 7.8 crores.

At a recent seminar on 'Cardamom' organised in Bangalore by the Indian Institute of Foreign Trade, in collaboration with the Cardamom Board, problems relating to the cultivation of cardamom, research finance, quality control and export marketing were discussed and recommendations of farreaching significance for the development of the cardamom industry have been made. Production of cardamom being more of an intensive nature, it has been suggested that apart from making available fertilisers, insecticides, and pesticides in adequate quantities, the cardamom board should make arrangements for the supply of sprinkler irrigation equipment, wherever ~~xxx~~ water facilities are available, for use during drought. Similarly, since the life of a cardamom plantation is very short compared to other plantations, it has been recommended that the State Governments concerned should amend the Agricultural Income Tax laws suitably so as to treat replanting expenses of cardamom as revenue expenditure and not as capital expenditure. Other recommendations of the seminar include extension of the activities of the cardamom board, and the creation of a 'cardamom development fund'. As for export marketing, two suggestions have been made at the seminar, viz., (a) export of cardamom coffee to Saudi Arabia, Kuwait and Bahrein Islands and (b) development of exports of cardamom oil. (The Planters' Chronicle 62(19);1967;373).

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E:3C5 Chromatography method

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E982 Enzyme

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PART III. Technical News Brief

J588 Soyabean HIGH PROTEIN SOYBEANS BEING DEVELOPED FOR FUTURE MARKETS

Soybeans, one of the cheapest sources of protein, may soon provide even more protein for livestock feed and for human consumption, according to the **USDA**.

Average composition of soybean varieties currently grown is 40.5 per cent protein and 21 per cent oil. In contrast, experimental varieties developed and tested by ARS and state agricultural experiment stations, have yielded from 10 to 12 per cent more protein than present commercial varieties.

In experiments at the State Agricultural Experiment Station, Stoneville, Mississippi, ARS agronomist E.E. Hartwig produced an experimental line, called D60-9647, with 45.1 per cent protein and 19.4 per cent oil. Lee, the variety most commonly grown in the South, yielded 40.7 per cent protein and 21.9 per cent protein and 21.9 per cent oil in the Stoneville tests.

D60-9647 is lower in protein than some of the lines used in the crosses that produced it. However, in the Stoneville tests it yielded 2,376 pounds per acre, compared to 2,328 for Lee.

In the past, the major emphasis in soybean development has been for varieties with a high percentage of oil. Soybean oil came into prominence during World War II as a replacement for imported vegetable oils. Meal, a by-product, was sold for livestock feed.

Expanded markets for high-protein meal as a livestock feed have increased its value. On the basis of 10-year averaged prices of meal and oil, meal has accounted for 58 per cent of the total value of soybean crops. (Oils & Oilseed J 20;1967;10).

F3 Food Technology BITTER SWEET

Bitter foods can be made more palatable, thanks to a discovery by an American research team.

Chemists from a research corporation in Massachusetts claimed recently that they had identified two chemicals in the taste buds of the tongue responsible for distinguishing bitter and sweet flavours. The chemicals were isolated for the first time from the tongues of cows, Dr. Fran Dastoli told the national meeting of the American Chemical Society.

Two chemicals functioned by forming a temporary bond with a blood molecule changing shape according to its bitterness or sweetness, and reporting to the brain with a tiny electrical current. By locking this link, it might now be possible to mask the flavour of bitter foods, making them more acceptable Dr. Dastoli said (Food Indus J 1;1967;8).

F308:xP,FR Grain, Preservation, Chemical Treatment
CHEMICAL TREATMENT FOR STORAGE OF MOIST GRAIN

BP CHEMICALS (UK) LTD., industrial solvents division, are actively developing new techniques of forage conservation which is hoped to be of value to agriculture, at home and abroad.

These techniques arise from the development of applications of propionic, formic and acetic acids, of which the company is said to be the largest European manufacturer at its Hull factory. Simple organic acids also occur as natural products of ruminant digestion and are known to be harmless in small quantities. Two applications of these materials are the subject of intensive farm trials this year; these concern moist grain storage and silage making.

Regarding the moist grain storage, the BP Chemicals system involves spraying a small quantity of propionic acid on to grain when it is transferred by auger to storage, thereby inhibiting mould or bacterial growth and consequential grain deterioration. It is claimed to be effective at moisture contents upto at least 30 per cent. The system has an advantage over the more usual methods of grain storage, particularly for stock feeding in that expensive drying and aeration equipment or specialised sealed storage is not necessary.

The company stress that the addition of propionic acid also affects the germination of the grain and it should not, therefore, be used on grain intended for malting or for seed. Although propionic acid has well established uses in baking, quantities used in moist grain are higher than those allowed in flour; this means that at present, grain destined for flour milling should not be treated by this method.

In 1966 trials were undertaken at five locations, and quantities of upto 50 tons of grain were treated. It was reported that all were successful and the treated grain remained in excellent condition. This year 20 farms and college establishments are cooperating in extensive trials, and quantities upto 150 tons of grain will be treated upto a total of 1,500 tons in all.

In addition, the Ministry of Agriculture have been undertaking similar trials work on both moist grain and silage at a number of experimental husbandry farms. (Milling 149;1967;103).

F3Zj,ZQL Butter, Powder
POWDERED BUTTER

The dairy division of the Australian Government's Scientific Research Organisation has developed a process for the production of powdered butter. It is expected to go into commercial production soon.

Powdered butter, it is claimed can be dry-blended into cakes, pudding mixes and ice-cream without tedious creaming.

It is made in much the same way as powdered milk. Sugar is added to cream or butter oil and pushed in a fine spray into a heated chamber. The water is evaporated and the powder falls into a tray. Because the powder is fragile and unstable when hot, it is cooled while held in suspension by a stream of air (Food Indus J 1;1967;8).

F3ZG51 Tea

TRI CLAIMS NEW TEA MAKING PROCESS

The Ceylon Tea Research Institute has claimed 'spectacular advances' in the understanding of the biochemical processes that take place in the tea leaf from the time it forms on the shoot till it is converted into made tea. The claim was made before the Tea Commission by a deputation from the Institute.

This knowledge, the deputation said, had been applied to certain problems concerned with the manufacture of instant tea, particularly, cold water solubility. According to the deputation, complete cold water solubility of instant tea had been achieved in the laboratory without taking anything away from the original extract. The new biochemical knowledge was also being projected into the manufacture of black tea.

The deputation said that so much was now known about what flavour and quality really were, that by strict biochemical control of withering fermenting, great improvements in the low country and off-season mid and up-country teas would soon be possible. The tea commission was set up recently by the Government to go into the various aspects of the tea industry extensively and make recommendations to the Government for its improvement.

The deputation was of the view that the time would come when so much would be known about quality and flavour that these desirable characters would be obtained throughout the year. The time is nearly upon us for, without this centenary year of the first commercial planting of tea in Ceylon, the Tea Research Institute will have made the most revolutionary contribution to the tea industry since the invention of mechanical roller'.

By using radio-active tracer techniques, the biochemical pathways that led to quality and flavour in green leaf had in the main been elucidated and what was more, they could be simulated at will in the laboratory but not yet in the factory.

The deputation was also of the view that eventually the tea maker with the new Research Institute process would be able to make quality teas with the leaf that came into his factory all the year round and not as at present, according to the whims of the weather (Planters' Chronicle 112;1967;418).

F3ZGB Coffee

INSTANT COFFEE * WITH A DIFFERENCE

As a boon to the housewife comes the cheerful news from the National Dairy Research Institute at Karnal that it has evolved a new preparation called coffee-condensed milk which can be reconstituted into "ready to drink" coffee by the mere addition of hot water.

The preparation contains instant coffee, sweetened milk and stabilisers.

The cost of a cup of the new beverage has been worked out at 25 paise.

The launching of the new product is part of the research programme on condensed and dried milk at the Institute.

The Institute claims that the new product can be kept in good condition for eight weeks at 15 degrees Centigrade and can be served either hot or cold, or in cold whipped condition (Food Indus J 1;1967;8).

F94

EDIBLE FAT FROM COTTONSEED OIL CAUSING CHANGES IN FOOD PACKAGING

An edible fat developed from cottonseed oil by US Department of Agriculture scientists is producing changes in packaging nuts and should result in similar changes in packaging other food products.

Developed by utilization scientists in USDA's agricultural research service, the new fat protects foods from the effects of oxygen, freezer burn, and dehydration, and from discoloration, during refrigeration. It is pliable and solid at temperatures below 115°F.

The fat currently is being used in packaging several million in packaging several million pounds of walnut and pecan meats in retail-sized bags annually. The fat is tasteless and colorless, and is sprayed on in such a thin film that it is virtually invisible to the eye. This film is important; it locks out oxygen and retards rancidity for long periods of time, eliminating the need for canning in a nitrogen atmosphere.

By eliminating the need for canning, the fat film cuts processing costs. Packaging nut meats in bags costs only about 15 to 20 cents per case, compared with about 95 cents per case for canning.

Chemists Reuben O. Feuge and Norman V. Lovegren at the ARS Southern Utilization Research Laboratory at New Orleans say that the chemically modified fat should be equally helpful in packaging meats, poultry, fish and both fresh and dried fruits and vegetables.

Other uses for the new fat include coatings for cheeses; emulsifiers in cake mixes, icings; and cream fillings; lubricants for food processing machinery; and in pharmaceuticals. The fat is already finding use in cosmetics such as shaving cream, foundation creams, hair sprays, lipstick and baby oils.

In 1962, about 35,000,000 pounds of edible coatings were used on food products where the new fat might compete. USDA economists estimate that the market may rise to about 73,000,000 pounds annually within the next two years.

Produced by a process called "molecular distillation", the fat currently costs about 50 cents per pounds. But this cost is expected to drop as production techniques are improved and as production keeps pace with increasing consumer demand for additional conveniences in food marketing and preparation. (OILS and OILSEED J 20;1967;10).

X8(F39s,ZQL):545 Groundnut, Meal, Export
EXPORTS OF DE-FATTED GROUNDNUT MEAL FROM INDIA

Quantity in tonnes

Value in Rs. lakhs

Countries	1961-62		1964-65	
	Quantity	Value	Quantity	Value
East European Countries				
Poland	22,870	76	130,828	551
Germany East	27,660	92	102,693	437
Czechoslovakia	2,760	9	95,889	395
Hungary	39,873	131	92,651	400
Yugoslavia	7,951	25	49,545	212
U.S.S.R.	--	--	29,954	133
Bulgaria	2,960	12	13,964	62
Rumania	--	--	--	--
Total	104,074	345	515,524	2,190

Percentage of total exports 26% 24.7% 63.4% 64.4%

(Oils & Oilseeds J 20;1967;12).

X8(F39Q1):545 Banana, Export
BANANA EXPORT HIT

The closure of the Suez canal has hit the export of bananas from India to the Soviet Union. While green bananas can be preserved in good condition for three weeks after plucking, a consignment to Russia will take 42 days via the Cape of Good Hope. Through the Suez it took only 12 days.

The Soviet Union had placed an order for 8,000 tons of bananas from India this year. The loss in foreign exchange is Rs. 90 lakhs.

Suez closure also affected the export of mangoes to France. One consignment had reached that country, but the second consignment of eight tons had to go round the Cape of Good Hope. Mangoes, which can be preserved for four weeks, were almost spoiled. The State Trading Corporation, which exported the mango, suffered a loss of Rs. 10,000 in foreign exchange. (Food Indus J 1;1967;25).

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PART III. Technical News Brief.J:4:634 Pest Control
PEST CONTROL

A panel of experts of the food and agricultural organisation, meeting in Rome in September, underlined the importance of biological and ecological **methods** of pest control, either by themselves or in conjunction with chemicals.

The experts said that pests could be controlled by introducing among them natural enemies or infertile males so that breeding might be reduced. Early maturing crops could be grown so that they could be harvested before the pests start ruining them. (Food Indus J 1;1967;24).

F3 Food Technology
WOOD FLOUR AS FOOD

Saw dust from certain trees contains minerals and the flour made from it can be used with foods, a tapioca specialist, Mr. P.V. Thomas, said in Ernakulam recently. He said that the kelp tree, growing in the sea contains minerals and kelp pills are being used with food in certain countries.

Mr. Thomas suggested that the dust of such trees should be analysed to find out whether it has nutritive value. The wood flour of the trees can be used as cattle feed. (Food Industries Journal 1;1967;24).

F39F:xP,FE Herb, Freeze-drying
FREEZE-DRYING PROCESS FOR HERBS

McCormick Foods (UK) Ltd., manufacturers of packaged spices and seasonings, will introduce freeze-dried chopped chives on Nov. 1.

After cleaning and chopping, the chives are first flash frozen, then rehydrated in a vacuum. Since water in a vacuum evaporates below its usual boiling point, a mild application of heat can turn the ice crystals in the chives to vapour without ever passing through the liquid state. As a result, when moisture is returned to the chives by their contact with any food to which they are added, they return to their natural appearance, texture and flavour. McCormick's hope to introduce further freeze dried herbs and spice products in the future. (Food Processing & Marketing 36;1967;382).

F3Zj Butter
BUTTER KEEPS WELL WITHOUT REFRIGERATION

Brief information is given of the results of tests carried out at Kiel on dry butter (a description of its manufacture is given in The Milk Industry 59(2) 46 (1966) which had been stored in tins for 3 years at +8°C; the butter was made from fresh 80% fat winter cream. The product had a yellow-white colour, was spreadable and its organoleptic characteristics could be restored by incorporating water.

To assess the processing possibilities the product was made into ripened cream butter, coffee-cream and whipping cream. For butter making the dry butter was melted, mixed with skimmilk at 40°C, homogenised at 10 atmospheres pressure, cooled to 17-18°C and incubated at this temperature with 3% starter for 8 hours. The product was then cooled to 10-12°C and churned next day in the normal way. Coffee-cream was made by diluting the dry butter with skim-milk and homogenising at 40°C under 150 atmospheres pressure followed by filling and in-bottle sterilisation. In the preparation of whipping cream, water and skimmilk were mixed with the butter and the mixture was homogenised twice at 40°C under a pressure of 10 atmospheres. After cooling to 2°C and storage until the next day the mixture was whipped at 5°C.

Examination of the butter revealed a slight metallic flavour which was not previously noticeable in the dry butter. Coffee cream had a "sterilised" flavour which apparently was lost on addition to coffee. Whipping cream could not be distinguished from fresh whipping cream and defects such as rancid or stale were not noted. J Heiber, Molkerei-Zeitung, 20(49) 1537 (1966) (in German). (Milk Industry 61;1967;38.

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